BANGALORE METRO CORPORATION LIMITED

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Driving Bangalore Ahead

BANGALORE METRO RAIL PROJECT PHASE - 2A TENDER DOCUMENT FOR

Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project.

TENDER NO. BMRCL/CEE-US/All Reach/PH-2/2024-25/DPO/641

VOLUME-1(Part-A)

QUALIFICATION CUM TECHNICAL PACKAGE

December-2024

III Floor, BMTC Complex
K.H. Road, Shanthinagar
Bangalore-560 027

BANGALORE METRO RAIL CORPORATION LIMITED

BANGALORE METRO RAIL PROJECT PHASE- 2

Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project.

Tender File No. BMRCL/CEE-US/All Reach/PH-2/2024-25/DPO/641

Summary of Tender Documents

Volume – 1 : Qualification cum Technical Package

- Section I - Notice Inviting Tender (NIT)

Part - A

- Section II - Instructions to Tenderers (ITT)
- Section III - General Conditions of Contract (GCC)
- Section IV - Special Conditions of Contract (SCC)
- Section V - Form of Tender
- Section VI - Proforma
  - Annexure A – Form of Agreement
  - Annexure B – Form of Bank Guarantee for Tender Security/EMD
  - Annexure C – Form of Bank Guarantee for Performance Security
  - Annexure D – Proforma Indemnity Bond
  - Annexure E – Tenderer's Declaration
  - Annexure F – Undertaking by The Tenderer
  - Annexure G – Work Experience
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- Technical Specifications

Volume – 2 : Financial Package

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VOLUME – 1

SECTION - I

NOTICE INVITING TENDER (NIT)

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BANGALORE METRO RAIL CORPORATION LIMITED
III Floor, BMTC Complex, K.H. Road,
Shanthinagar, Bangalore – 560 027
Karnataka, India
E-mail: contactus@bmrc.co.in; **Web:** www.bmrc.co.in;

No: BMRCL/2024-25/EL/WORK_INDENT65 Date: 26.12.2024

TENDER NOTIFICATION

Bangalore Metro Rail Corporation Ltd., (BMRCL) a Joint Venture of Government of Karnataka (GoK) and Government of India (GoI), invites Tenders **(Single stage-Two Envelope System)** through Karnataka Public Procurement Portal (e-Procurement Portal) from the eligible Tenderers having valid **"Class-I Electrical License"** issued by **the Electrical Inspectorate, Government of Karnataka,** and having previous experience in the Works of similar nature, volume and complexity complete during the last Five (5) Years as mentioned in the Tender documents for the work mentioned below under on "TOTAL TURN KEY" basis.

The brief scope of the work is provided in Instructions to the Tenderers (ITT) and the detailed description of work is provided in Technical Specifications.

Key details:

Tender Notification No: BMRCL/2024-25/EL/WORK_INDENT65		
Name of the Work: *Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project.*		
Sl.No	**Description**	
1.	Estimated cost of Work	**Rs.9,97,49,485.00** (Rupees Nine Crore Ninety-Seven Lakh Forty-Nine Thousand Four Hundred and Eighty-Five Only)
2.	Tender Security / EMD (In Rs)	**Rs.14,96,242.00** **(**Rupees Fourteen Lakh Ninety-Six Thousand Two Hundred and Forty-Two only) The EMD (Tender Security) shall be furnished in the form of a Bank Guarantee (B.G)/e-BG in favour of Bangalore Metro Rail Corporation Limited.
3.	Completion period of Works	9 Months including monsoon period
4.	Receipt of tender last date	Tender documents to be downloaded from Karnataka Public Procurement Portal (https://kppp.karnataka.gov.in) As per Date and Time specified in e-Procurement Portal.
5.	Last date for seeking Clarification	As per Date and Time specified in e-Procurement Portal.
6.	Last Date and Time for Receipt of Bid / Tender	As per Date and Time specified in e-Procurement Portal.
7.	Pre Bid Meeting	As per Date and Time specified in e-Procurement Portal.
8.	Date and Time of Opening of Technical Bid/Tender Opening (Qualification Cum Technical Package)	As per Date and Time specified in e-Procurement Portal
Sl.No	**Description**	

9.	Date and Time of Opening of Financial Bid/Tender (Financial Package)	Will be intimated to the Qualified Tenderers through e-Procurement Portal. Tenderers to trace the same.
10.	Place of Opening of Tender (Qualification Cum Technical Package & Financial Package)	The opening of the Qualification cum Technical Package shall take place at e-Procurement portal, i.e. https://kppp.karnataka.gov.in
11.	Address for Communication	**The Chief Engineer(U/S),** Bangalore Metro Rail Corporation Limited., III Floor, BMTC Complex, KH Road, Shanthinagar, Bangalore- 560027, Karnataka, India. Tele: +91 80 22969233, FAX +91 80 2296 9222, E-mail: bnataraja@bmrc.co.in

Chief Engineer (U/S)
Bangalore Metro Rail Corporation Ltd

BMRCL

BANGALORE METRO RAIL CORPORATION LIMITED
III Floor, BMTC Complex, K.H. Road,
Shanthinagar, Bangalore – 560 027
Karnataka, India
E-mail: contactus@bmrc.co.in; **Web:** www.bmrc.co.in;

Tender No. BMRCL/2024-25/EL/WORK_INDENT65 **Date: 26.12.2024**

NOTICE INVITING TENDER

1. Bangalore Metro Rail Corporation Ltd., (BMRCL) invites Tenders from the eligible Contractors having valid **"Super Grade Electrical License"** issued by the **Electrical Inspectorate, Government of Karnataka,** for the work of **"**Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project**".** Local competitive Bidding (LCB) will be conducted in accordance with the "Single Stage-Two Envelope" Tendering Procedure through Karnataka Public Procurement Portal (e-Procurement Portal). This Tender is a 'PERCENTAGE TENDER'.
2. Details of the Tender are as under:

Sl. No	Name of the Work	Estimated Cost of work (INR)	Tender Security / EMD (INR)	Period of completion of work
1.	Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project	9,97,49,485/-	14,96,242/-	9 Months

3. **REGISTRATION:**

a) Tenderers are required to enroll on the e-Procurement Portal (https://kppp.karnataka.gov.in) by clicking on the link "Tenderers Registration" on the Karnataka Public Procurement Portal by paying requisite registration fee

b) As part of the enrolment process, the Tenderers will be required to choose a unique user name to assign a password for their accounts.

c) Tenderers are advised to register their valid email addresses and mobile numbers as part of the registration process. These would be used for any communication with the Tenderer.

d) Upon enrolment, the Tenderers will be required to register their valid Digital Signature Certificate (Only Class III Certificates with signing + encryption key usage) issued by any Certifying Authority recognized by CCA India.

e) Only one valid DSC should be registered by a Tenderer. Please note that the Tenderers are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.

f) Tenderers then login to the website through the secured log-in by entering their user ID/password and the password of the DSC / e-Token.

BMRCL

g) The scanned copies of all original documents (as required) should be uploaded on portal in PDF/JPG format.

h) For any query regarding e-procurement on the Karnataka Public Procurement Portal, contact helpdesk number: +91-8046010000, +91-8068948777, support@eprochelpdesk.com.

4. **SEARCHING FOR TENDERS/BIDS:**

Once the Tenderers have selected the proposal bids/tenders and if they are interested to participate, the Tenderers can pay non-refundable processing fee to Karnataka Public Procurement Portal.

However, the tenderer shall submit such transaction details along with their tender submission on e-portal. If the same transaction reference number has been submitted for more than one bid, all such bids shall be considered ineligible and summarily rejected.

It will be the responsibility of the Tenderer to check the website and see any Addendum/Corrigendum issued in this tender from time to time and ensure submission of Tender submittals binding accordingly.

5. Tender documents consist of the following Volumes/Parts/Sections,

Volume – 1: Qualification Cum Technical Package

- SECTION – I Notice Inviting Tender.

Part - A

- SECTION – II Instructions to Tenderers.
- SECTION – III General Conditions of Contract
- SECTION – IV Special Conditions of Contract
- SECTION – V Form of Tender
- SECTION – VI Proforma

Part – B

- Technical Specifications

Volume – 2: Financial Package

6. Tenderer's submittals must be accompanied by a EMD/Tender Security for an amount as mentioned at in the table under Tender Notification clause 2, in the requisite form as described in clause 16 of Instructions to Tenderers (ITT).The EMD shall be valid for a period of 45 days beyond the validity of Tender.
7. Tenders must be submitted electronically through Karnataka Public e-Procurement Portal (https://kppp.karnataka.gov.in) before the last date & time prescribed in the e-procurement portal using a valid DSC (Digitally signed certificate).

All Tenderers are requested to note that the original of those documents in hardcopy as listed under ITT clause 13.2 should be submitted by 'Speed post' or 'in person' at BMRCL office within **5 days** from last date of Tender submission. Tender submission without such submission of original documents shall be liable for rejection.

8. 'Qualification cum Technical Package' will be opened as per the latest specified time and date published in the e-Procurement portal.

The Financial Packages of technically qualified Tenderers will be opened at a date and time advised by BMRCL through e-Procurement portal.

9. The Tenderer shall provide credentials in support of their eligibility, qualifying criteria, technical capability, financial strength/support and past work experience by supporting documents / client certificates / CA's audit reports set forth in ITT Clause 2.

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10. Tenders shall be valid for a period of **120 days** from the last date for submission of Tenders.
11. Tenders cannot be submitted online after stipulated time of submission of Tender.
12. The Contract shall be governed by the stipulations of documents listed under 'Contract Agreement' as per Annexure-A Section-VI - Proforma.
13. BMRCL requires that Tenderers and Contractors observe highest standard of ethics during the procurement and execution of Contract. In pursuance of this policy, the Employer;
    a) Will reject the Tender for the Work or rescind the Contract, if BMRCL determines that the Tenderer / Contractor have engaged in Corrupt or Fraudulent practices, at any stage.
    b) will declare a Contractor ineligible, either indefinitely or for a stated period of time, to be awarded a Contract, if he at any time determines that the Tenderer or the Contractor has engaged in Corrupt or Fraudulent practices in competing for, or in executing, the contract.
14. BMRCL reserves the right to accept or reject any or all Tenders in part or full without assigning any reasons. No Tenderer shall have any cause of action or claim against BMRCL for rejection of his Tender.
15. Registered Tenderers with e-token are advised to frequently check the e-Procurement portal for any amendments like Addendum / Corrigendum.
16. BMRCL will not be held responsible for consequential damages/losses due to lack /interruption of power supply & internet, low speed of internet, System problems, loss of electronic information/data etc.
17. For further clarifications/details regarding the Tender document, contact: The Chief Engineer (Utility Shifting), BMRCL on +91 80 2296 9233, Fax +91 80 2296 9222, Email: bnataraja@bmrc.co.in.

    For any query regarding eProcurement portal/ Tender submission, please contact helpdesk at +91-80-46010000, +91-80-68948777, Email: support@eprochelpdesk.com.

Chief Engineer (U/S)
Bangalore Metro Rail Corporation Ltd

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PART - A

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Section III	-	General Conditions of Contract (GCC)
Section IV	-	Special Conditions of Contract (SCC)
Section V	-	Form of Tender
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INSTRUCTIONS TO TENDERERS (ITT)

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SECTION II – INSTRUCTIONS TO TENDERERS (ITT)

A. GENERAL

1. Brief Description of the Project:

1.1 Bangalore Metro Rail Corporation limited (BMRCL), a Special Purpose Vehicle (SPV) established under the Companies Act, 1956 (hereinafter referred to as "BMRCL" or "the Company" or "the Employer" or "the Client") invites Tenders from the registered Electrical Contractors ("Super Grade Electrical License" issued by the Electrical Inspectorate, Govt. of Karnataka) under single stage two packet system for "Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project" as per terms and conditions contained in this Tender documents.

Bangalore Metro Rail Corporation Ltd. (BMRCL) is implementing the Bangalore Metro Rail Project in different phases. The Phase – I of the project comprises of two Corridors Viz. East-West Corridor (Purple line) and North– South Corridor (Green line) consisting of Elevated, at Grade and Underground sections as below:

Sl. No	Corridor/Section	Number of Stations	Approx. Length (Km)
1	East–West corridor (Purple line) from Baiyappanahalli Station to Mysore Road Station.	17	18.10
2	North- South corridor (Green line) from Nagasandra Station to Yelachenahalli Station.	23	24.20
Total		**40**	**42.30**

1.2 BMRCL is proceeding with the implementation of Phase-2 of the project. The sanctioned Detailed Project Report (DPR) of Phase-2 envisages extension of existing two corridors viz. East-West (Purple line) and North-South (Green Line) Corridors comprising of elevated sections and construction of two new lines Reach-5 and Reach-6.

The details of Extension lines and New lines under Phase-2 are given below:

Sl. No	Corridor/Section	Number of Stations	Length (Km)
1	**East Extension (R1A & R1B):** Baiyappanahalli to ITPL Whitefield (Elevated) with Depot at Whitefield	13@	15.42
2	**West Extension (R2A & R2B):** Mysore Road to Challaghatta (Elevated) with Depot at Challaghatta	7	8.85
3	**North Extension (R3C):** Nagasandra to Bangalore International Exhibition Centre (BIEC) (Elevated) with Depot at Peenya	3	2.95
4	**South Extension (R4B):** Yelachenahalli to Silk Institute (Elevated) with Depot at Anjanapura	5	6.55
5	**Reach-5** : R V Road to Bommasandra Industrial Area (New Line - Elevated) with Depot at Hebbagodi	16	18.82

Sl. No	Corridor/Section	Number of Stations	Length (Km)
6	**Reach-6 (Elevated)**: Kalena Agrahara to Swagath Road Cross (New Line) with Depot at Kothanur	6	8.18
	R6 (Underground): Swagath Road Cross to Nagavara (New Line) with Depot at Kothanur	12	14.27
Total		**62**	**75.04**

@ - includes two-level common interchange station at K.R. Puram with ORR Metro line.

$ - includes two-level common interchange (between Reach-5 & Reach-6) station at Jayadeva Hospital. Also, Stations at Rashtreeya Vidyalaya (R.V) Road & Central Silk Board shall have interchange with other lines of BMRCL.

 # - includes two-level common interchange stations at M.G. Road and Nagavara with other lines of BMRCL.

South Extension is commissioned in January 2021, West Extension in August 2021, East extension in March-2023 and other Reach is under advanced stage of completion.

1.3 Two more new lines under Phase-2A and Phase-2B are being constructed. Details of New lines under Phase-2A and 2B are given below:

Sl. No.	Corridor/Section	Number of Stations	Length (Km)
1	**Phase- 2A**: Silk board to K R Puram with Depot at Baiyappanahalli Phase 2A (8+8 stabling lines at grade and -1 level)	13 Number of Stations (All Elevated Stations)	19.75
2	**Phase-2B**: K R Puram to Airport Terminal with two Depots at Baiyappanahalli Phase 2B (14+14 stabling lines at grade and -1 level) and Trumpet	17 Number of Stations (15 Elevated Stations, 1 UG Station & 1 at grade Station)	38.44
Total		30 Number of Stations	**58.19**

***Interchange Stations** of different lines: -*

- *The common interchange station between Reach-6 line and Phase-2B line is at **Nagavara** station.*
- *The common interchange station between Phase-2A and Reach-5 is at **Central Silk Board** station.*
- *The common interchange station between Phase-2A and Line-1 is at **KR Puram** Station.*

Maintenance Depots are located at Baiyappanahalli for Phase-2A & 2B and Airport (Trumpet) Depot for Phase-2B. An Integrated Operation Control Centre (OCC) is being constructed at Baiyappanahalli for Reach-5, Reach-6, Phase-2A (ORR) & Phase-2B (Airport line) and a Back-up Control Centre (BCC) is located at Peenya.

1.4 Not Used

1.5 **Brief scope of work**

The brief scope of work is shifting of uncharted BESCOM Electrical Utilities which includes, but not limited to

i. Supply, Laying, Jointing, Testing and commissioning of 11kV UG cables & RMUs, shifting of transformer centers & other electrical equipment's etc;
ii. Design and Detailed Engineering to match the new cable and cables accessories with the existing UG cable system under employer's requirement
iii. Complete Manufacture including Shop Testing of Equipment's/Materials in the Scope of the Contractor after availing the BESCOM approved Vendors.
iv. Providing Engineering Drawings, Data, Operation Manual, etc for BMRCL's approval for the Equipment's/Materials in the Scope of the Contractor.
v. Packing and Transportation from the Manufacturer's Works to the Site of Equipment's/Materials in the Scope of the Contractor.
vi. Receipt, Storage, Preservation and Safe keeping of Equipment at the Site.
vii. Pre-assembly, if any, Erection, Testing and Commissioning of all the Equipment.
viii. Reliability Tests and Performance and Guarantee Tests on Completion of Commissioning.

The details of equipment to be supplied, transported, erected, assembled, tested & commissioned are indicated in BOQ / Pricing Document schedule of Works. The quantities indicated in the BOQ / Pricing Document Schedule of works are only approximate and may increase or decrease and prices quoted by the Tenderer are deemed to be valid in spite of such variations subject to SCC Clause 10.

Any other items not specifically mentioned but which are essentially required for satisfactory performance & completeness of work, shall be deemed to be included in the scope of specifications and works and the same shall be executed / carried out by the Tenderer at no extra cost to BMRCL.

2. Technical/ Financial Eligibility Criteria for Tenderers:

2.1 The Tenderer shall have proven track record and must satisfy the criteria stated below for further evaluation and selection. Tenderer shall have adequate knowledge of underground cable transmission system and connected procedures including quality control, and shall have infrastructure and erection facilities and capacity to execute the works.

2.2 The Tenderer should have a valid **"Class-I Electrical License"** issued by the Electrical Inspectorate, Government of Karnataka. Attested copy of the License shall be furnished. Original Document of the license shall be produced for verification by BMRCL after opening of the Qualification cum Technical Package as requested.

2.3 **Technical Eligibility Criteria:**

2.3.1 **Work Experience**: The Tenderer should have an experience of carrying out similar electrical works such as: "Construction of HT/LT Distribution networks, Layout Electrification Erection, commissioning of RMUs, Distribution Transformers, HT/LT UG cable work "and should have completed similar works during the last five years ending 28 days prior to date of opening of Tender and fulfill the following to establish the same:

i. The Tenderer should have completely executed at least **One similar work** valued not less than **Rs.4,98,74,743/- (Rupees Four Crore Ninety-Eight Lakh Seventy-Four Thousand Seven hundred and Forty-Three Only)**

OR

ii. The Tenderer should have completely executed at least **Two similar works** each of value not less than **Rs.3,98,99,794/- (Rupees Three Crore Ninety-Eight Lakh Ninety-Nine Thousand Seven Hundred and Ninety-Four Only).**

OR

iii. The Tenderer should have completely executed at least **Three similar works** each of value not less than **Rs.2,99,24,846/- (Rupees Two Crore Ninety-Nine Lakh Twenty-Four Thousand Eight Hundred and Forty-Six Only).**

2.3.2 **Work Experience**: The Tenderer should have an executed in one year (for a continuous period of) the following minimum quantities of work (80% of the BOQ Quantity) i.e (i) 8 no's of RMUs,(ii)14.96 kms of HT UG Cables and 12 kms of LT UG Cables

Note-1: The Tenderer shall furnish necessary documentary evidence and end user certificates issued from authorities not below the rank of Executive/ Divisional Engineer such as the work Completion Certificate, Performance certificates, etc., shall mention the nature of work, items, quantity of work executed and failing which the bid will be summarily rejected.

2.4 **Financial Eligibility Criteria:**

Annual Turnover: Each Tenderer in his name should have achieved in at least two (2) out of the last five (5) financial years period (2019-20, 2020-21, 2021-22, 2022-23 and 2023-24) an annual turnover of **Rs.19,94,98,970/-** (Rupees Nineteen Crore Ninety-Four Lakh Ninety-Eight Thousand Nine Hundred and Seventy Only).

Note. Updated to the FY in which the tenders are invited. Financial turnover of previous years shall be given a weight of 10% per year to bring them to the price level of the FY in which the tenders are invited

2.5 **Tender Capacity:**

Eligible Tenderers will get qualified only if their available Tender capacity is more than the Tender value. The Tenderer's Tender capacity will be calculated as under:

Tender Capacity = (A X N X 1.5) – B

Where,

A = *Maximum value of Works executed in any one year during the last five years (updated to 2024-25 Price level) taking in to account the completed as well as works in progress.*

N = *No. of years prescribed for completion of the works for which Tenders are invited.*

B = *Value, at 2024-25 price level, of existing commitments and ongoing works to be completed during the contract period.*

2.6 The Tenderer should not have been black listed by KPTCL / BESCOM / BBMP /KPWD /CPWD / Railways /MES / National High way or erstwhile KEB or by any department of Government of Karnataka and any other Central Government department including PSUs. An undertaking to that effect shall be furnished as per Annexure F in Section VI Proforma.

2.7 **Joint Venture or Consortium is not permitted in this Tender.**

2.8 **DETAILS OF KEY PERSONNEL**

i) For Fresh Tenderers.

The details of deployment of the following personnel should be furnished in Format I.

Format I:

Sl. No	Details of Personnel to be deployed for the tendered works.	Name of the Person	Educational Qualification	Experience	Remarks
1.	Project Manager		BE (Elec.) / Equivalent	10 Years	
	Project Engineer		BE / Diploma (Elec.)	6 Years	
	Site Engineer/s		Diploma (Elec.)	3 Years	

i) **For BMRCL Working Contractors (Those who are already working in BMRCL as Contractors):**

Contractors those who are already awarded Work by BMRCL and intend to participate in the Tender, shall possess the following additional requirements for qualifying in the Tender.

a) Separate team of personnel is required to be deployed for each works, particularly the Project Engineers and the Site Engineers. The curriculum Vitae of the personnel deployed/to be deployed shall be furnished as detailed in Clause (b) below.

b) The details of deployment of the following personnel should be furnished in Format II.

Format II:

Sl. No	Details of Personnel working for the tendered works.	Name of the Person	Educational Qualification	Experience	Remarks
1.	**Personnel for the ongoing work/s:**				
	Project Manager		BE (Elec.)/Equivalent	10 Years	
	Project Engineer		BE / Diploma (Elec.)	6 Years	
	Site Engineer/s		Diploma (Elec.)	3 Years	
2.	**Personnel for the new tendered work:**				
	Project Manager		BE (Elec.)/Equivalent	10 Years	
	Project Engineer		BE / Diploma (Elec.)	6 Years	
	Site Engineer/s		Diploma (Elec.)	3 Years	

2.9 Notwithstanding anything stated above or elsewhere in the Tender specification, BMRCL reserves the right to relax the qualifying requirements and assess the capability/suitability of the Tenderer to perform the overall Contract should the circumstances warrant such assessment in the overall interest of BMRCL.

2.10 Tenderers shall have adequate erection facilities and capacities. The Tenderer shall have Quality Assurance Plan for procuring of materials, erection and commissioning.

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2.11 Purchase of Tender document will not automatically mean that Tenderers are considered qualified. Such qualification will be reviewed again at the time of the evaluation of the Tenders. Intending parties who fulfill the qualifying requirements are advised to visit the sites to familiarize themselves with the nature and quantum of works & site conditions.

2.12 The Tenderer shall furnish certified copies of financial reports such as profit and loss statements, balance sheets, auditor's reports, in support of the same, for the financial years 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24. (Provisional financial statements are not acceptable).

2.13 Tenders shall be valid for a period of 120 days from the latest date of submission of Tenders and shall be accompanied with a Tender Security/EMD as described in Clause 23.0 of the Instructions to Tenderers (ITT).

2.14 A firm after purchase of the Tender documents in their name can submit Tender only in the same name.

2.15 Only those Tenderers are eligible for opening of Financial Package, who fulfills the eligibility criteria and Technical requirements and short listed by BMRCL as per clause 2 above, after opening of the Qualification cum Technical Package.

2.16 **Sub-Contracting**

The Contactor shall not, without the previous written consent of the Engineer assign or Sub-contract his Contract or any part thereof except for minor works. Any such consent given by the Engineer shall not relieve the Contractor from any obligations, duty or responsibility for all or any action of the Sub-contractor as if those actions are committed by the Contractor himself.

3 Cost of Tendering.

The Tenderer shall bear all expenses associated with the preparation and submission of his Tender and the cost of Tender documents/drawings. BMRCL shall in no case be responsible or liable for reimbursement of such expenses or other claims regardless of the conduct or outcome of the Tendering process.

4 Site Visits

4.1 The Tenderer is advised to visit and examine the Site of Works and familiarize themselves with the nature of work, site conditions, its surroundings and obtain on his own responsibility all information including constraints that may be necessary for preparing the Tender and entering into Contract and carrying out the work. The costs of any such visits shall be entirely at the Tenderers own expense. BMRCL shall not entertain any request for clarifications from the Tenderers, regarding such Local conditions. It will be imperative on each Tenderer to fully inform himself of all Local conditions and factors which affects the execution of the contract.

4.2 The Tenderer or any of his authorized personnel will be granted permission by BMRCL to enter their premises for the purpose of such inspection, but only on the express condition that the Tenderer and/or his authorized agents, will release and indemnify BMRCL, from and against all liabilities in respect thereof and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, cost and expenses, however, caused which but for the exercise of such permission would have not arisen.

BMRCL

4.3 The Tenderer shall be deemed to have inspected and examined the site and collected all necessary information regarding all factors and conditions likely to influence in carrying out the work, before uploading on e-procurement portal and submitting his Tender.

4.4 The Equipment shall be packed for transportation so as to meet the space and weight limitation of transport facilities especially along the Rail/ Road. Approval from concerned Railway Authorities for movement of over dimensional consignment/package shall be obtained by the Contractor before starting manufacture of such equipment.

4.5 The requirements, conditions, appendices etc., stated in various sections of Volume-1, and Volume-2 shall be considered as part of this Section as if bound together. In case of any discrepancy between the provisions of this Section and other Sections, the provisions of this section shall prevail.

4.6 It must be understood and agreed that such factors have properly been investigated and considered while submitting the Proposals. No Claim for financial adjustment to the Contract Awarded under these Specifications and Documents on account of Local conditions will be entertained by the Owner. Neither any change in the Time Schedule of the Contract nor any financial adjustments arising thereof shall be permitted by the Owner, which are based on the lack of such clear information or its effect on the Cost of the Works to the Tenderer.

5 Brand Names

5.1 Specific reference in the specification to any material by trade name or catalogue number shall be construed as establishing a standard of quality and performance. However, during construction, Tenderers may offer equivalent brand for approval of Engineer-in-charge. It is assumed that the rates quoted cover the cost of specified brands.

5.2 All materials used shall conform to technical specifications, relevant standards and BMRCL/ BESCOM approved makes.

6 Stamp Duty and Legal Charges

It shall be the responsibility of the successful Tenderer to pay stamp duty for Contract Agreement or any other matter in connection with the Contract, as per the applicable/latest Government regulations.

7 Time for Completion of Work

Time for completion of the work shall be as stated in Appendix of form of Tender (Section V).

8 Work Plan

8.1 Within 15 days of award of contract, the successful Tenderer shall submit on the portal a detailed work plan along with manpower deployment in line with ITT 2.8 for the implementation of work complying with the schedule of work as stipulated in the Tender document for supply, installation, testing and commissioning.

8.2 The Tenderer to furnish along with Tender submittals, a list of construction plant, equipment's, list of jobs on hand, name of the Project Engineer for this work to facilitate Tender evaluation.

8.3 The work shall be executed as per BESCOM / BMRCL requirements.

B. TENDER DOCUMENTS

9 Content of Tender Documents

9.1 The Tender consists of the following documents, together with addendum/corrigendum, if any.

Volume – 1: Qualification Cum Technical Package

SECTION – I Notice Inviting Tender.

Part - A

SECTION – II Instructions to Tenderers.

SECTION – III General Conditions of Contract

SECTION – IV Special Conditions of Contract

SECTION – V Form of Tender

SECTION – VI Proforma

Part – B

Technical Specifications

Volume – 2: Financial Package

10 Interpretation and Clarification of Tender Documents

Tenderers shall carefully examine the Tender Documents and fully understand the conditions and matters which may affect the work or the cost thereof. In case the Tenderer finds any discrepancies or omission from the specification or other documents, or in doubt as to their meaning, the Tenderer shall at once address query (ies) online through Karnataka Public Procurement Portal (e-Procurement portal).

BMRCL will offer clarification to such queries received through eProcurement portal up to the date specified therein. Any such queries with details of clarification sought, will be uploaded in the eProcurement portal (https://kppp.karnataka.gov.in) without disclosing the identity of the Tenderer seeking clarification. No separate further communication in this regard will be entertained.

11 Amendment of Tender Documents

12.1 At any time prior to the deadline for the submission of Tenders, BMRCL may, for any reason, whether at their own initiative or in response to clarifications requested by prospective Tenderers modify, the Tender document by issuing Addenda / Corrigendum.

12.2 Such Addenda / Corrigenda will be uploaded in the e-Procurement portal. It will be the responsibility of the Tenderer to frequently check the portal for any Addenda/Corrigenda or any other updates issued from time to time and ensure submission of Tender accordingly.

12.3 The Tenderer is not permitted to make any alterations/modifications to the Tender conditions. No modifications to the specifications, item descriptions, etc. will be entertained.

C. PREPARATION OF TENDERS

12 Language of the Tender

Tenders and all accompanying documents shall be in English. In case any accompanying printed literature is in other language, it shall be accompanied by an English translation. The English version shall prevail in matters of interpretation.

13 Documents Comprising the Tender

13.1 The Tender submittals shall comprise the following documents and Tenderer shall upload clear and readable scanned copies of these documents on e-Procurement Portal.

i. Qualification cum Technical Package:

a) Tender Security / EMD, in accordance with ITT clause 16. In case of non-legible EMD document, tender will be summarily rejected.

b) A Covering Letter stating any other matter in relation to his Tender which the Tenderer considers should be drawn to the particular notice of BMRCL.

c) Valid "Class-1 Electrical License" issued by the Electrical Inspectorate, Government of Karnataka.

d) Tenderer's Declaration as per Annexure-E, Section-VI.

e) Tenderer's Undertaking as per Annexure-F, Section-VI.

f) Work Experience details as per Annexure-G, Section-VI

g) Work completion certificate(s) to establish the Eligibility Criteria.

h) Financial eligibility information as per Annexure-H, Section-VI.

i) Contractor's Equipment/Machinery Details as per Annexure-I, Section-VI.

j) List of manpower including the Bio-Data of Engineer-in-charge.

k) Notarized Power of Attorney of the person who is signing the Tender submittals.

l) Tender Index indicating all the Tender submittals with identical page numbers.

m) Any other document required under the provisions of Tender document.

ii. Financial Package

The Tenderer shall fill in and complete the 'Financial Package' online through Karnataka Public Procurement Portal only and no hard copy of commercials should be attached or disclosed elsewhere.

13.2 **Original Documents (Hardcopy):**

The Tenderer is required to submit the following documents in original (hard copy) within the date time and place mentioned in ITT Clause 20.7:

(i) Tender Security / Earnest Money Deposit (EMD), as per ITT clause 16,

(ii) Notarized Power of Attorney and Board Resolution (as applicable) as per ITT clause 18.

(iii) Any other documents as specified in the tender document.

In case of failure in submission of the above documents within stipulated date, the Tender may be treated as incomplete and be liable for rejection

14 Tender Prices

14.1 The Tender is **Percentage Tender**. The Contract shall be for the whole of the works as described in the tender documents and the cost of all the individual items shall be computed for the entire work and the Tender premium (above or below or at par) on the Total cost shall be quoted.

14.2 Contract prices shall be inclusive of all applicable taxes, duties ,levies and cess including taxes to be deducted at source, Insurance and exclusive of SGST and CGST as specified under GCC clause 26. BMRCL shall pay the SGST and CGST as applicable as per laws. The

evaluation and comparison of Tenders shall be made accordingly by BMRCL. No claim will be entertained on this account after acceptance of the Tender or during the currency of the Contract.

14.3 Any additional item/s which is not found in the BOQ, if required for completion of the work under this Contract, the rate for which shall be as per referred BESCOM / KPWD Schedule of Rates plus accepted Tender premium. If the item/s required is not found in any of the State Schedule of Rates, then market rate shall be adopted, but no Tender premium would be applicable, which includes the latest updated GoK SoRs.

14.4 If the Tender submittal contains any handwritten portion, it shall be ensured that such writing is clear, legible and duly authorized by the person signing the Tender and that no over writing or erasing is adopted, failing which the Tender is liable for rejection.

14.5 The Tenderer shall keep the contents of his tender and percentage quoted by him confidential.

15 Currencies of Tender and Payment

The price shall be quoted in Indian Rupees only. All payments to the Tenderer, under the proposed Contract shall be in Indian Rupees.

16 Tender Security / Earnest Money Deposit (EMD)

16.1 The Tenderer shall furnish, as part of its Tender, interest free Tender Security / EMD as per Karnataka Public Procurement Portal.

16.2 The Tender Security / EMD is required to protect BMRCL against the risk of Tenderer's conduct which would warrant the security's forfeiture.

16.3 The Tender shall furnish with his tender, an EMD (Tender Security) for the value indicated in e-Procurement Portal in any of following mode:

a) The tenderer shall pay full EMD (Tender Security) amount through e-procurement portal by making online payment through the e-Procurement Portal.

OR

b) The tenderer shall pay full EMD (Tender Security) as mentioned on the portal shall be furnished in the form of a Bank Guarantee (B.G)/e-BG issued in favour of Bangalore Metro Rail Corporation Ltd., from Indian Schedule Bank (excluding Co-operative banks) or from a Scheduled Foreign Bank as defined in section 2(e) of RBI Act 1934 read with Second Schedule preferably drawn on and payable and extendable at a designated Branch in Bangalore, as per the proforma given in Annexure-B, Section-VI.

The Tender Security/EMD shall remain valid for a period specified in 'Appendix to Form of Tender'. The validity of Tender Security/ EMD shall be extended by the Tenderer suitably in line with the extension of Tender validity as per ITT clause 2.13 & 17.

The Scheduled Bank issuing the Bank Guarantee should preferably be on "Structure Financial Messaging System (SFMS)" platform. A separate advice of the BG shall preferably be sent by the issuing bank to the Employer's Bank through SFMS.

The issuing Bank shall send the SFMS to:
Name: BANGALORE METRO RAIL CORPORATION LTD.,
Name of the Bank: BANK OF INDIA
Branch: CANTONMENT BRANCH, BENGALURU.
Account No: 840420110000760
RTGS/IFSC: BKID0008404

The scanned copy of the BG and a copy of "MT760COV (for Bank Guarantee message) / MT767COV (for Bank Guarantee amendment message) Report" sent by the BG issuing Bank, should be uploaded by the tenderer in the e-Procurement Portal as a part of his offer during tender submission. The tenderers should ensure that (scanned copy of BG) is uploaded to the e-procurement portal, failure of which, the tender will be summarily rejected by the Employer. The Original Bank Guarantee shall compulsorily be submitted in the BMRCL office before scheduled date, time and place as specified under ITT clause 20.7. The tenderer shall note that the Original Bank Guarantee submitted through speed post/ in person, if not received before the scheduled date and time as specified in ITT clause 20, the Tender will be summarily rejected.

The details of the Bank Guarantee (exception of e-BG), Physically submitted should match with the details available of the scanned copy uploaded and the data entered during Tender submission time, failing which, the Tender will be rejected.

In case of non-reconciliation of online EMD (Tender Security) portion through e-Procurement portal in Government of Karnataka central pooling account held at the ICICI Bank, the tender will get rejected.

16.4 Tender Security/EMD will not be accepted in any form other than those mentioned above. Tenders not accompanied by the required amount of Tender Security/EMD and non-submission of hardcopy (other than e-BG) as per ITT clause 20.7 will be rejected by the Employer.

However, BMRCL reserves the right to accept or reject the Tender Security/EMD with any deficiency otherwise not materially affecting the technical qualification criteria of the Tenderer.

16.5 The Tender Security/EMD of unsuccessful Tenderers will be released / returned, when the Contract Agreement has been signed with the successful Tenderer. However, the Tender security of the successful Tenderer will be released/returned on receipt of the Performance Security / Security Deposit by the Employer and upon signing of the Contract Agreement as per Annexure-A, Section VI.

16.6 The Tender Security/EMD may be forfeited:

a. If a Tenderer withdraws his Tender during the period of Tender validity,

OR

b. If a Tenderer resiles abandon from a Tender,

OR

c. In case the successful Tenderer fails to:

(i) furnish the required Performance Security / Security Deposit as per ITT clause 32, and

(ii) sign the Contract Agreement as per ITT clause 33 and GCC clause 12.

16.7 The tender will be summarily rejected by the Employer in case of:

(i) Failure to deposit online EMD portion and failure to upload clear & readable copy of Bank Guarantee including e-BG towards Balance EMD.

(ii) Failure to submit the Original Bank Guarantee (exception to e-BG) to BMRCL Office within the date & time specified.

(iii) EMD (Tender Security) in the form of Bank Guarantee /e-BG is from any source other than an Indian Scheduled Bank and Scheduled Foreign Bank as defined in Section 2 (e) of RBI Act 1934 read with Second Schedule.

(iv) The EMD (Tender Security) in the form of Bank guarantee is from a Co-operative bank.

(v) The EMD (Tender Security) amount is less than the required amount as mentioned in NIT.

In case EMD (Tender Security) is in the form of BG/e-BG, validity fulfils the 'Tender Validity Period', but falling short in regard to period of 'EMD (Tender Security) Validity' , the Employer shall request such Tenderer(s) in writing to submit compliant EMD (Tender Security) within 10 (Ten) working days from the date of request. Failure to provide a compliant EMD (Tender Security) within the prescribed period shall cause the rejection of the Tender and it will be considered as Non-responsive

16.8 In case the bidder submits Electronic Bank Guarantee (e-BG), entity number of BMRCL for providing e-BG shall be: AAACB4881D (PAN of BMRCL).

16.9 If the bidder has opted to submit the tender security/ EMD in the form of Electronic Bank Guarantee (e-BG), a copy of the e-BG shall invariably be included in the EMD envelope.

17 Tender Validity

17.1 Tenders shall be valid for acceptance for such period as stated in 'Appendix to Form of Tender' (Section-V). Tenders valid for a period shorter than specified period of validity as aforesaid shall be rejected.

17.2 In exceptional circumstances, prior to expiry of the original Tender validity period, the Employer may request the Tenderers to extend the validity for a specified additional period. The request and the responses thereto shall be made in writing only or by facsimile or E-mail.

A Tenderer may refuse the request without forfeiting the Tender Security/EMD. A Tenderer agreeing to the request will not be required or permitted to modify his Tender. Only one communication either extending the validity or refusing to extend the validity would be entertained. If the validity is not extended, no further representation, if any, to revive the Tender at a later date will be entertained.

18 Format and signing of Tenders

18.1 The Tenderer shall follow and submit the Tender documents in the respective formats prescribed under section -VI- proforma only.

18.2 The Tender submittals shall be typed or written in indelible ink (wherever required), which is to be scanned and digitally signed using class-III digital signature by person(s) duly authorized to bind the Tenderer to the Contract. Proof of authorization shall accompany the Tender in the form of notarized 'Power of Attorney'. All pages of the Tender where entries, amendments, corrections, alterations, erasures etc. have been made shall be initialized by the person(s) signing the Tender.

18.3 All witnesses and sureties shall be persons of status and probity and their full names, occupations and addresses shall be stated below their signatures.

19 Alternative Proposal by Tenderers:

Tenderers shall submit offers that comply with the requirements of the Tender documents, including the basic technical design as indicated in the drawing and specifications. Alternatives will not be considered

D. SUBMISSION OF TENDERS

20 Submission of Tenders

20.1 All Tender Proposals digitally signed along with the other Qualifying documents should be submitted Electronically through Karnataka Public Procurement Portal on or before the last date and time for Tender submission as published therein.

20.2 Tenderer, in advance, should get ready the proposal documents to be submitted as indicated in the Tender document / schedule in PDF /JPEG formats.

20.3 Tenderer should log into the portal well in advance for the submission of the proposal so that it gets uploaded well in time, i.e. on or before the last date & time for Tender submission. Tenderer will be solely responsible for any delay due to other issues.

20.4 The Tenderer has to digitally sign and upload the required proposal documents one by one as indicated in the tender document.

20.5 The server time (which is displayed on the dashboard) will be considered as the standard time for referring the deadline for submission of the proposals by the Tenderers, opening of proposals etc. The Tenderers should follow this time during proposal submission.

20.6 The necessary certificates/documents in support of fulfilling eligibility criteria and Technical requirements shall be scanned and attached to e-Procurement portal.

20.7 **Original documents to be submitted in hardcopy:**

The Tenderer shall seal and submit the original documents listed in ITT clause 13.2 in original (hard copy) by speed post or in person at BMRCL office within **5 days** of last date of online Tender submission. Only the tender(s) submitted & accepted online, the hardcopies will be considered for evaluation. The Hardcopies should carry/accompany copy of "soft copy submitted time and acceptance acknowledgement from Employer / e-Procurement Portal".

The envelope shall bear the following identification:

TENDER NO. .....

ORIGINAL SUBMITTALS OF QUALIFICATION CUM TECHNICAL PACKAGE

BMRCL Office Address for submission of hard copy:

The Chief Engineer (U/S),
Bangalore Metro Rail Corporation Limited,
III Floor, BMTC Complex,
K.H. Road, Shanthinagar,
Bangalore-560 027,
Karnataka, India.

The Tenderer can submit the hard copies by speed post or in person at the above address during 11.00 am to 5.00 pm on all working days. In case, 5th day happens to be a holiday then the next working day shall be considered as last day for submission of the hard copies.

20.8 All Tenderers have to submit "unconditional Tenders and without any deviations", together with requisite Tender Security/EMD.

21 Deadline for Submission of Tenders

21.1 Tenders must be submitted online through Karnataka Public Procurement Portal on or before the date & time as specified in the Portal and in time submission of tender is the responsibility of the Tenderer. Original Document (Hard Copy) as listed under ITT 13.2 shall be in the place, date & time as specified in ITT 20.7.

21.2 BMRCL may, at their discretion, extend the deadline for submission of tenders by issuing an amendment in which case all rights and obligations of BMRCL and the Tenderers previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

22 Late or delayed Tenders

In online e-Procurement Portal, the Tenderer shall not be able to submit the Tender after the last date and time for Tender submission as the icon for the task in the e-Procurement Portal will be disabled.

Hardcopies (as per ITT clause 13.2) received by BMRCL after the deadline for submission as mentioned in ITT clause 20.7 will be rejected.

23 Modification and Withdrawal of Tenders

23.1 Tenderer may modify and correct or upload any relevant document in the portal till Tender submission date and time as published in the e-Procurement Portal.

23.2 No Tender shall be modified subsequent to the deadline for submission of Tenders.

23.3 Withdrawal or modification of a Tender during the intervening period between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Tenderer in the Tender Form will result in forfeiture of Tender Security/EMD pursuant to ITT Clause 16.

E. TENDER OPENING AND EVALUATION

24 Tender Opening and Evaluation

24.1 Qualification Cum Technical Package:

24.1.1 Opening of Qualification Cum Technical Package (Technical Bid/Tender) of all Tenders:

Employer will open the Qualification Cum Technical Package (Technical Bid/Tender) of all the Tenders received through e-procurement Portal at the time and date fixed for Technical Bid.

Before opening the Technical Bid of a Tenderer, the Employer will verify the EMD first. If EMDs are not in proper form, the technical Bid will not be opened for such tenderers. Interested tenderers or their authorized representatives who choose to attend or may view the same on the portal on the scheduled date and time from their end. In the event of the specified date for Tender opening being declared a holiday by the Employer, the Tenders will be opened at the appointed time and location on the next working day.

24.1.2 The Tenders will be examined for the following submittals:

i. Presence of valid Tender Security / EMD,
ii. Presence of Qualification cum Technical Package and all enclosures as per ITT clause 13.1 and,
iii. Submission of original documents as per ITT clause 13.2.

24.1.3 If any Tender contains any deviation from the Tender documents and /or if the same does not contain Tender Security in the manner prescribed in the Tender documents, then that Tender is liable for rejection. Incomplete Tenders in respect of above would be rejected.

Tenderers whose, Qualification cum Technical Package are found acceptable after evaluation would be informed of the date and time of opening of Financial Package through Portal.

24.2 Financial Package

The Financial Package of the Tenderers, whose Qualification cum Technical package were found acceptable, will be opened in the presence of those Tenderers or their representatives, who choose to be present and also can view the opening on e-procurement portal from their end. In the event of the specified date for Financial Package opening being declared a holiday by the Employer, the Tenders will be opened at the appointed time on the next working day.

The Tenderer's name, the Percentage rate (above or below or at par), Tender price, the total amount of each Tender, any discounts, Tender Modifications and Withdrawals, and such other detail as the Employer may consider appropriate, will be announced by the Employer at the opening.

Conditional Tenders are not acceptable and will be summarily rejected. The Employer shall prepare minutes of the Tender opening, including the information disclosed to those present and the minutes shall form part of the Contract.

25 Process to be Confidential

25.1 The Tender Invitation Documents and any addenda thereto, together with any further communications, are issued for the purpose of inviting Tenders only. The Tenderer shall not disclose any information contained in the documents or otherwise supplied in connection with this Tender invitation to any third party except for the purpose of preparing its Tender. The Tenderer shall maintain complete confidentiality till the Contract is awarded.

25.2 After the opening of Tenders, information relating to the examination, clarification, evaluation, Tenders and recommendations concerning the award of Contract shall not be disclosed to the Tenderers or any other persons not officially concerned with such process until the award of the Contract to the successful Tenderer.

25.3 Any effort by a Tenderer to influence BMRCL personnel or representatives on matters relating to Tenders under study in the process of examination, clarification, evaluation and comparison of Tenders and in decisions concerning award of Contract, may result in the rejection of the Tenderer's Tender.

25.4 The Tenderer shall undertake that it will treat as confidential all matters arising in connection with the Tender. The documents are issued only for the purpose of preparing and submitting the Tender offer in response to the invitation and not for any other purposes.

26 Clarification of Tenders

26.1 To assist in examination, evaluation and comparison of Tenders, BMRCL may ask Tenderers individually for clarification of their Tenders including breakdown of unit rates/prices. The request for clarification and the response shall be in writing, but no change in the price or substance shall be permitted except conforming clarifications sought.

26.2 No Tenderer shall contact the Employer on any matter relating to its Tender from the time of the Tender opening to the time the contract is awarded.

27 Examination of Tenders and Determination of Responsiveness

27.1 Prior to detailed evaluation of Tenders, the Employer will determine whether each Tender:

a. Is accompanied by the required Tender Security/EMD,
b. Has been properly signed by an Authorized signatory.
c. Meets qualifying criteria, and;
d. Is responsive to the requirements of the Tender documents.

27.2 For the purpose of this clause, a substantially responsive Tender is one, which conforms to all the terms, conditions and specifications of the Tender documents, without material deviation or reservation. The material deviation or reservation is one which affects in any substantial way the scope, quality or performance of the works, or which limits in any substantial way or is, inconsistent with the Tender documents, BMRCL's rights or the Tenderers obligations under the Contracts and the rectification of which, deviation or reservation would affect unfairly the competitive positions of other Tenderers presenting substantially responsive Tenders.

27.3 If a Tender is not substantially responsive to the requirements of the Tender documents, it will be rejected by BMRCL.

28 Correction of Errors

28.1 Tenders determined to be substantially responsive will be checked by BMRCL for any arithmetical errors in computation and summation, Errors will be corrected by BMRCL as follows:

a) Where there is a discrepancy between quoted rate of percentage above or below or at par in figures and in words, the percentage above or below or at par, in words will govern.
b) If percentage rate above/below/at par is not written/typed either in figures or words, the percentage rate shall be considered at par for evaluation purpose.

28.2 The total Tender price quoted will be adjusted by BMRCL in accordance with the above procedure for the correction of errors and the concurrence of the Tenderer shall be deemed and binding upon the Tenderer. If the Tenderer does not accept the corrected price of the

Tender, his Tender will be rejected and will result in forfeiture of the Tender Security / EMD pursuant to ITT clause 16.

28.3 If the Successful Tenderers price, is seriously unbalanced or over priced in the opinion of the Employer, the Employer may require the Tenderer to produce detailed price analysis for any or all items and Sub-heads of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed.

F.AWARD OF CONTRACT

29 Acceptance / Award of Contract:

The Employer will award the Contract to the Tenderer, who meets the Eligibility and Qualification Criteria, whose Tender has been determined to be substantially responsive and complete in accordance to the Tender requirements, and whose Evaluated Tender Price is determined to be lowest.

30 Right to Accept or Reject any or all Tenders

30.1 BMRCL shall not be bound to accept the lowest or any Tender or to assign reasons for non-acceptance of any Tender. BMRCL reserves the right to accept a Tender either in whole or part.

30.2 BMRCL reserves the right to award the Tender as single Contract or can split into part Contract as desired by BMRCL.

30.3 BMRCL reserves the right to accept or reject any Tender, to annul the Tendering process and reject all Tenders, at any time prior to award of Contract, without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the grounds for BMRCL action.

31 Notification of Award

31.1 Prior to the expiration of the Tender validity, BMRCL will notify the successful Tenderer by cable or Fax or Telex or Email. This letter (hereinafter and in the conditions of Contract called "Letter of Award") shall specify the amount which BMRCL will pay to the Contractor in consideration of the execution, completion, operation, maintenance and guarantee of the works by the Contractor as prescribed by the Contract (hereinafter and in the conditions of Contract called "The Contract price").

31.2 Until a formal agreement is prepared and executed, the Tender together with the written acceptance of the LOA shall constitute a binding Contract between both the parties.

31.3 No further correspondence will be entertained by BMRCL from the unsuccessful Tenderers.

32 Performance Security / Security Deposit

32.1 Within fourteen (14) days of issue of the Letter of Award (LOA) by BMRCL, the successful Tenderer shall furnish Security for an amount of **Ten (10) percent of the Contract price** in any one of the following forms to guarantee the faithful performance of the Contract:

BMRCL

Contractor

a) Demand Draft or Pay Order or Banker's cheque payable at BENGALURU drawn in favour of Bangalore Metro Rail Corporation Limited, on any Indian Nationalized Bank located in India.

OR

b) Bank Guarantee/e-BG issued by an Indian Scheduled Bank (excluding Co-operative Banks) or from a Scheduled Foreign Bank as defined in Section 2(e) of RBI Act 1934 read with Second Schedule drawn on and payable/Extendable at a designated branch in Bangalore as per the format given in Annexure-C of Section VI.

The Bank Guarantee/e-BG shall be valid for a period of three (3) months beyond completion of Warranty period.

No interest shall be paid on Performance Guarantee.

32.2 **Additional Performance Security**

After evaluation of the price analysis, taking into consideration the schedule of estimated contract payments, the Employer may require an Additional Performance Security, at the expense of the successful Tenderer to a level sufficient to protect the Employer against financial loss in the event of default of the successful Tenderer under the Contract, as specified below:

i. If the tender price offered by the successful Tenderer is lower than 10% but up to 20% of the estimated cost, then the additional performance security shall be calculated at 10% of the difference in the:
   (a) Estimated cost (as mentioned in NIT) – 10% of the estimated cost and
   (b) The tender price offered by the lowest evaluated Tenderer.

ii. If the tender price offered by the successful Tenderer is lower than 20% of the estimated cost then the additional performance security shall be calculated at 15% of the difference in the;
   (a) Estimated cost (as mentioned in NIT) – 10% of the estimated cost and
   (b) The tender price offered by the lowest evaluated Tenderer.

If such an additional Performance Security is required by the Employer, the successful Tenderer shall furnish the same, failing which his tender shall be liable for rejection. The additional performance security shall be valid up to contract period in consideration or any extension or issuance of acceptance/taking over certificate whichever is later, and released to the contractor on completion of the work. The performance Security and additional performance security shall be released one year after the date commissioning or handing over and completion of all contractual obligations, whichever is later

33 Signing of Agreement

33.1 Within twenty-one (21) days of notification of award of work, the successful Tenderer shall sign the Contract Agreement (Annexure – A of Section - VI) on a stamp paper of requisite value, purchased by him at his own cost.

33.2 Failure to execute the Contract Agreement within the said period may result in termination of Contract and award of the same to other agency/agencies at the risk and cost of the Contractor.

33.3 The Contract agreement shall be signed/executed by the duly authorized person to bind the Successful tenderer by notarized Power of Attorney.

34 Information Regarding any Relative of Contractor Employed in BMRCL

34.1 Should a Tenderer or Contractor have a relative employed in Managerial capacity in BMRCL or in case of partnership firm or Company incorporated under the Indian Company Law, should a partner or relative of the partner or a shareholder be employed in responsible position in BMRCL, the authority inviting Tender shall be informed of the fact at the time of submission of Tender. If such fact is suppressed at the time of Tendering and comes to light at any time after the acceptance of Tender, the Contract may be rescinded.

34.2 **Corrupt or Fraudulent Practices:**

34.2.1 The Employer requires that the Tenderers / suppliers / Contractors under this Contract, observe the highest standard of ethics during the procurement and execution of this Contract. In pursuance of this policy the Employer:

a. Defines, for the purpose of these provisions, the items set forth below as follows:

i) "Corrupt Practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution; and

ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a Contract to the detriment of the Employer, and includes collusive practice among Tenderers (prior to or after Tender submission) designed to establish Tender prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

b. Will reject a proposal for award of work if he determines that the Tenderer Recommended for award has engaged in corrupt or fraudulent practices in competing for the Contract in question.

c. Will declare a Tenderer ineligible, either indefinitely or for a stated period of time to be awarded a Contract/ Contracts if he at any time determines that the Tenderer has engaged in corrupt and fraudulent practices in competing for, or in executing the Contract.

34.2.2 BMRCL and each Tenderer submitting the Proposal shall comply with these conditions of Tender and in their dealings with each other, discharge their duties and obligations on time and with integrity and behave equitably, honestly and transparently.

35 One Tender per Tenderer

A Tenderer shall submit only one Tender. A Tenderer who submits or participates in more than one Tender will be disqualified. No Tenderer can be a Subcontractor while submitting a Tender in the same Tender process. A Tenderer, if acting in the capacity of Subcontractor in any Tender, may participate in more than one Tender, but only in that capacity.

36 Miscellaneous

36.1 The Contractor shall undertake not to enter into Subcontract with any other person or to transfer the Contract or any benefit there under to any person or firm without the prior written approval of BMRCL.

36.2 It is the responsibility of the Tenderer to check the documents on receipt for completeness and notify BMRCL of any discrepancy or omission.

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36.3 The Tenderer represents, warrants, and covenants that it will, throughout the term of performance of the Work under this Contract, maintain all required license status, professional ability, skills, and capacity to perform its obligations hereunder and will perform them in accordance with the requirements of the Contract Documents. The Contractor further represents and warrants that it can successfully perform the Work in conformity with Contract Documents and comply with all applicable laws, rules and regulations.

36.4 BMRCL reserves the right to request the Tenderers to make a presentation of their module or mode of carrying out the work and any such presentation shall be made at their own cost, risk and liability.

36.5 It is the responsibility of the successful Tenderer to make his own arrangements for obtaining necessary licenses, permits, clearance, from BESCOM, BBMP, BWSSB, Traffic police, Bharath Sanchar Nigam Ltd, and any other stake holder etc.., except as specified in the Contract.

36.6 Tenderers are required to fill in all the blank spaces in the Form of Tender as per Section V.

36.7 The Tenderers shall be presumed to have carefully examined the drawings if any, conditions and specifications of work & to have fully acquainted themselves with all details at site, locations, materials, geological formations, weather characteristics, labour conditions etc; pertaining to the work.

36.8 The Tenderers shall abide by all rules / acts in force with regard to safety, environment, worker's, transportation, etc. for carrying out the work in safe and efficient manner.

36.9 While all efforts have been made to avoid errors in drafting this tender documents the Tenderer is advised to check the same carefully and seek clarifications within the stipulated period only. No claim on account of any errors detected in the tender document shall be entertained.

36.10 Tenderer shall have adequate erection facilities and capacities. The Tenderer shall have quality assurance plan for procuring of materials, supply, installation, testing and commissioning.

36.11 Tenders shall be submitted for whole of the works defined in the Tender document. Tenders not covering the entire specified scope of work shall be treated as incomplete and rejected.

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SECTION – III

GENERAL CONDITIONS OF CONTRACT (GCC)

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SECTION – III : GENERAL CONDITIONS OF CONTRACT

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SECTION – III: GENERAL CONDITIONS OF CONTRACT

1 Definition of terms

1.1 In these general conditions, the following expressions shall be the meanings herein assigned to them, unless there is something in the subject or context inconsistent with such meaning.

1.2 **"BMRCL or Employer or Owner or Company or Purchaser"** shall mean the **"BANGALORE METRO RAIL CORPORATION LIMITED"**, which has jurisdiction over the area of works, and its successor if any.

1.3 **"Division"** shall refer to the respective office of BMRCL directly in charge of the works.

1.4 **"Contractor"** shall mean the successful Tenderer whether a firm, registered company, partnership or an individual, whose Tender has been accepted by BMRCL or by the Officer duly authorized on behalf of BMRCL, and who has entered into agreement with BMRCL for due fulfillment of the Contract and shall also include legal representatives, successors and assignees of the Tenders.

1.5 **"Engineer"** means the Officer of BMRCL in charge of the works or such other officer who may be appointed to act as the Engineer for the purpose of this Contract and shall also include the Chief Engineer/ Executive Engineer/ Assistant Executive Engineers or Officers of equivalent rank, directly in charge of the work authorized by BMRCL. The Contractor shall have the right of appeal against the orders of a lower ranked authority to the higher ranked authority of BMRCL whose decision shall be final and legally binding on all parties concerned.

1.6 **"Engineer–in-charge"** shall mean the Engineer of the concerned jurisdiction or his duly authorized officers.

1.7 **"Plant"** shall mean and include any or all plant, machinery, tools or other implements of all description necessary for the execution of the work in safe and workman like manner.

1.8 **"Work or Works"** shall mean the work or works set out and described in the Schedule of prices, drawings and specifications and which the Contractor has agreed to execute under the terms of Contract. It shall include all items of work, which unless specially excluded are necessary to execute the work as described.

1.9 **"Contract and Contract documents"** shall mean and include the General conditions of Contract, Special conditions, Specifications, Schedule of Prices, drawings and the stamped agreement.

1.10 **"Specifications"** shall mean the specifications annexed and such other specifications and the Schedule of drawings if any, as may be detailed and necessary due to particular nature of works wherever applicable i.e. specifications and construction practices published by the BBMP/BESCOM/KPTCL/Rural Electrification Corporation of India shall be applicable.

1.11 **"Site"** shall mean and include all the area in which operations in respect of the works are carried out. These terms shall also include material stacking yard and the area where temporary structures are put up for installing any machinery etc.

1.12 **"Month"** shall mean a month as reckoned by the English Calendar.

1.13 Words used in singular shall also include the plural and vice versa where the context so demands.

1.14 Word indicating one gender includes all gender.

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2 Contractor to inform himself fully

2.1 The Contractor shall be deemed to have carefully examined the Contract documents and to have visited the site and fully acquainted himself with the conditions of labour, roads, work, climate, rainfall, type of soil etc., prevalent in the area. Any information available with BMRCL regarding the site conditions will be made available to the Contractor, but BMRCL will not accept any responsibility for the accuracy thereof or the inference that may be drawn there from.

2.2 The Contractor shall in writing get necessary clarifications from the Engineer-in-charge in respect of the meaning of any of the conditions set forth in the Contract documents.

3 Contractor's representative and labour

3.1 The Contractor under intimation to the Engineer shall employ at least one competent representative with a minimum qualification of Diploma in Electrical Engineering duly approved by the Engineer- in – charge to carry out and supervise the works on behalf of the Contractor. The said representative or any one of such representatives, if there be more than one shall be present at the site during working hours, and any written orders or instructions given to such a representative by the Engineer-in-charge, shall be deemed to have been lawfully given to the Contractor.

3.2 The Contractor shall at all times employ labour of every description as the Engineer-in-charge may deem necessary for securing the proper progress of the works and shall on demand furnish from time to time such returns as may be required of the number and description of unskilled, skilled and supervisory staff actually engaged for the work.

3.3 The Contractor shall furnish the Engineer-in-charge with such reports as he may be required regarding the progress of the works and the organization in connection with the execution of the work.

3.4 The Engineer-in-charge has the right to object to the employment or presence of any representative or other persons or labour employed by the Contractor on the grounds of incompetence, negligence, misconduct and upon such objection being raised, the Contractor shall be bound to remove or cause to remove such person or persons and provide competent substitutes approved by the Engineer-in-charge. The Contractor shall not be entitled to any damage or loss that may be caused by such action of the Engineer-in-Charge.

3.5 **Subcontracting**

The Contactor shall not, without the previous written consent of the Engineer assign or Subcontract his Contract or any part thereof except for minor works. Any such consent given by the Engineer shall not relieve the Contractor from any obligations, duty or responsibility for all or any action of the Subcontractor as if those actions are committed by the Contractor himself.

Any breach of this clause shall entitle the Employer to rescind the Contract and render the Contractor liable for loss or damage arising due to termination.

4 Works - general information

4.1 The Contractor shall execute the works on **"TURNKEY BASIS"** which involves broadly the supply and transportation to works site, assembly, erection, testing and Commissioning of lines and equipment, backfilling and consolidation and returning the released materials to the respective stores of BMRCL or the owners of the assets as decided by BMRCL.

4.2 The details of equipment to be supplied, transported, assembled, erected, tested and commissioned in each package are indicated in the Financial Package. The quantities indicated in Schedule of Prices are only approximate & during the execution of the Contract, BMRCL reserves the right to increase or decrease the quantities of items under the Contract in accordance with the conditions of Contract.

4.3 Before finalizing the orders for purchase of materials the Contractor shall undertake survey of the works to be carried out and make a reliable estimate of the actual quantity of each material required for the intended works. The Engineer-in-charge shall arrange to facilitate the Contractor by furnishing the details of the works and route profile etc., as may be required for the purpose, including deputing of BMRCL officers to the extent deemed necessary by him. However, delay if any in this regard shall not constitute a valid ground for delay in completion of works.

4.4 Any other items of work not specifically mentioned, but which are essentially required for satisfactory performance & completeness of the works shall be deemed to be included in the scope of works and the same shall be executed / carried out by the Contractor.

4.5 The whole of the works together with any temporary works associated therewith shall be carried out by the Contractor in a satisfactory and workmanship like manner with the materials and workmanship as specified to the entire satisfaction of the Engineer-in-charge, and in such a manner as the Engineer-in-charge may direct. The Contractor shall attend to and carryout without any delay all orders and instructions which the Engineer-in-charge may issue from time to time.

4.6 The whole of the works shall be executed in strict conformity with the Contract documents and such explanatory, detailed or modified drawings and directions as may be furnished from time to time by the Engineer-in-charge for the guidance of the Contractor.

4.7 In case of any defect in material supplied or the work carried out or both noticed by BMRCL/Contractor during execution of the work or during the period of Performance Guarantee, the Contractor shall replace the defective material and redo the defective work to the satisfaction of Engineer-in-Charge or the authorized officer of BMRCL / BBMP / BESCOM / KPTCL.

4.8 The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Contract Price. The Contract Price shall cover all his obligations under the Contract and all things necessary for the proper execution and completion of the Works, testing and commissioning and remedying of any defects.

4.9 Contractor shall take full responsibility for adequacy of safety and security of the Works. He shall also have full regard for safety of all persons on or in the vicinity of the site.

4.10 The Contractor shall take all reasonable steps to protect the environment and to avoid injury, damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The Contractor shall ensure that air emissions, surface discharges and effluent from the Site during the Contract Period shall not exceed the values prescribed by law.

4.11 It shall be the responsibility of the Contractor to provide at his own expense the required sheds, store houses and yards for execution of the Works and provide free access to the Engineer or his Representative/s who will have right of inspection including that of instructing the Contractor to remove a particular material from the stores and not to use the same on the Works.

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5 Local Conditions

5.1 It will be imperative for each Contractor/ Tenderer to fully inform himself of all local conditions and factors, which may have any effect on the execution of the works and services covered under these documents and specifications.

5.2 It must be understood and agreed that such factors have properly been investigated and considered while submitting the Tender. No claim what so ever including those for financial adjustment to the Contract awarded under these specifications and documents shall be entertained by BMRCL. Further, no change in the time schedule of the Contract or any financial adjustment (s) arising thereof shall be permitted by BMRCL, which are based on the lack of such clear information.

6 Drawings

6.1 Unless otherwise provided for in the Contract, the Engineer-in-charge shall furnish to the Contractor, free of charge copies of drawings, and specifications as may be considered by the Engineer-in-charge to be reasonably necessary for the execution of the work.

6.2 Drawings, specifications and copies thereof furnished by the Engineer-in-charge shall not be used for other works and shall be returned to the Engineer-in-charge, on completion of the works. Drawings, specifications or other Contract documents shall not be reproduced or caused to be reproduced, without the previous written permission of the Engineer-in-charge.

6.3 All the drawings required for execution of work shall be got approved from BMRCL Authorities before execution of work.

7 Contract includes all necessary operations

7.1 The Contract includes the whole of the works which are described herein or implied by the Contract documents or which may be inferred to be obviously necessary for the efficiency, stability and completion of the permanent works and the performance of all operations and the supplying of all materials and things described in or implied by the Contract documents or which may be deemed necessary for the completion of the works in all respects to the complete satisfaction of the Engineer-in-charge, shall be deemed to be included in the Contract.

7.2 Works shown upon drawings without being mentioned or described in the specifications or shall nevertheless be held to be included in this Contract in the same manner as if they had been expressly shown upon the drawings and described in the specifications also.

8 Discrepancy between drawings and specifications

8.1 In case of errors, omission and / or disagreement between the written and scaled dimensions on the drawings or between the drawings and specifications, the Contractor shall make a reference to the Engineer-in-charge, whose elucidation or decision shall be considered authentic. For any error in the work due to such errors or omissions or disagreements, if he fails to refer them to the Engineer-in-charge, and get elucidation before starting the work, or specific part of the work executed, he shall himself be liable for the consequential losses, if any.

9 The contractor shall supply and be responsible for the efficiency of the means employed.

The Contractor shall supply and bear responsibility for procuring all materials, plant, Labour, scaffolding, timbering, machinery, tools and other implements and generally all means required for the `fulfillment of the Contract, whether such means be or not be recommended by the Engineer-in-charge. No materials, plant, tools, tackles or equipment brought to the site for use on the works shall be removed from the site without previous written permission of the Engineer-in-charge.

10 Watch and ward

Except as may be specifically provided the Contractor shall be responsible for all proper watch & ward of all works comprised in the Contract & for providing necessary temporary footways & fences etc.

11 Safety Devices

The Contractor shall at his own cost provide such safety devices, like steel or fiber glass helmets, slings, ropes, belts, covering for legs and hands, masks, etc., for the safety of personnel and glow tapes, glow signs, barricades, etc., for the safety of public, commuting near the work place. when working underground or in water or when handling cement, or working on steep slopes etc., and as the Engineer-in-charge may direct in the interest of safeguarding the workmen from liability to accidents or damages to health and to carry out such measures as the Engineer-in-charge may prescribe in this behalf. The Contractor shall be responsible for the workmen employed by him or third party in case of accidents or damages resulting in bodily injury or affecting their health and to carry out such instructions regarding preventive or safety measures as the Engineer-in-charge may prescribe on this behalf. The Contractor shall also be solely responsible for the adequacy of the strength and design of scaffolding, gangways, and notice board etc., erected for the execution of the works. All the works shall be in conformity with all the laws prevailing on the land.

12 Agreement and Performance Security

12.1 Within a period of **Fourteen (14) days** or such other period as may be mentioned in the letter of notification of award of the Tender, the Successful Tenderer shall furnish the required Performance Security and shall enter into an Agreement with BMRCL within Twenty-one (21) days of Notification of Award of works according to the conditions of the Contract on Karnataka Government Stamp paper of requisite value as per the format enclosed at Annexure-A. The cost of the stamp duties and similar charges imposed by law shall be borne by the contractor.

12.2 Performance Security is a deposit with BMRCL of an amount equal to **Ten (10) percent of the Contract Price.** The Performance Security shall be in the form of:

a) Demand Draft or Pay Order or Banker's cheque payable at Bengaluru drawn in favour of Bangalore Metro Rail Corporation Limited, on any Indian Nationalized Bank located in India.

OR

b) Bank Guarantee/e-BG issued by an Indian Scheduled Bank (excluding Co-operative Banks) or from a Scheduled Foreign Bank as defined in Section 2(e) of RBI Act 1934 read with Second Schedule drawn on and payable/Extendable at a designated branch in Bangalore as per the format given in Annexure-C of Section V. The Bank Guarantee/e-BG shall be valid for three (3) months beyond the date of completion of Warranty period.

12.3 Failure of the successful Tenderer to furnish the required Performance Security shall be a ground for the annulment of the award of Contract and forfeiture of the Tender Security / EMD pursuant to ITT clause 16.

12.4 The whole or such portion of the Performance Security amount as he may consider fit shall be liable to be forfeited by the Employer at the discretion of the Employer, in the event of any breach of Contract on the part of the Contractor.

12.5 In the event of variations during the execution of the Contract which result in payments to the Contractor over and above the original Contract Price, the Performance Security shall be suitably adjusted every 6 months at the request of the Employer.

12.6 All expenses incurred for completing and stamping the Contract Agreement shall be borne by the Contractor. The stamped Agreement shall be deposited with BMRCL and a copy of the Agreement signed by both parties shall be delivered to the Contractor.

12.7 After the Tender has been accepted by BMRCL or by any Officer duly authorized by BMRCL to accept the Tender, all orders and instructions to the Contractor, except as herein otherwise provided, will be given by the Engineer-in-charge, on behalf of BMRCL.

12.8 In case the validity of the Bank Guarantee/e-BG for performance of Contract is to be extended for any reason, the Contractor shall get the validity extended and the cost of which shall be borne by the Contractor.

12.9 The Performance Security shall be released one year after completion of the entire work, commissioning, handing over and completion of all Contractual obligations including Warranty period, whichever is later.

13 Liability for accidents to persons

13.1 The Contractor shall be solely responsible for all accidents to persons employed by him, which may arise in the execution of the works, and from whatever cause they may arise during execution and maintenance of works included in the Contract and shall arrange for insurance as prescribed in the Tender document.

13.2 The Contractor shall indemnify BMRCL against all action, suits, claims, demands, cost of expenses arising in connection with injuries suffered upto the date when the works or plant shall have been taken over under and of the clauses herein by persons employed by the Contractor or his Subcontractor whether under the general law or under the Employee's compensation Act or any other statute in force on the date of the Contract dealing with the question of the liability of employee from injuries suffered by employees and to have taken steps properly to ensure against any claims there under.

13.3 On the occurrence of accidents which result in the death of the workmen employed by the Contractor or which result in injury so serious as to be likely to result in the death of any such workmen, the Contractor shall within 24 hours of happening of such accident, intimate in writing to the concerned Engineer-in-charge, the details of such accidents. The Contractor shall indemnify BMRCL against all loss or damages sustained by BMRCL resulting directly or indirectly from Contractors failure to give intimation in the manner aforesaid or otherwise to confirm to the provision of the Employee's compensation Act, in regard to such accident. In the event of any claim being made or action brought against BMRCL due to negligence of the Contractor and arising out of the matter there of the Engineer

in-charge of BMRCL shall assist, if so required, but at the sole expense of the Contractor, and, he may conduct all negotiations for the settlement of the case or any litigation that may arise there from. In such cases, BMRCL shall at the expense of the Contractor extend all available assistance for any such purpose.

13.4 In the event of any accident in respect of which compensation may become payable under Employee's Compensation Act, whether by the Contractor or by BMRCL as Principal, it shall be lawful for BMRCL to retain out of money due and payable to the Contractor such sum or sums of money as may be in the opinion of the said Engineer-in-charge, sufficient to meet such liability. Any balance left out of money so retained after meeting such liability shall be refunded to the Contractor.

13.5 The Contractor shall at all times indemnify BMRCL against all claims for damages or compensation under the provisions of payment of Wages Act – 1936, Minimum Wages Act -1948, Employers Liability Act – 1938, the Employee's Compensation Act – 1923, Industrial dispute Act – 1947, Indian Factories Act- 1948, Contract Labour Act – 1970, Maternity Benefit Act – 1961 or any modifications thereof made therein from time to time.

13.6 The Contractor shall bear the liability of all the risks and insurance and BMRCL shall not be responsible for any liabilities, whatsoever in any way.

13.7 The Contractor shall deliver the policies / Certificates of Insurance to the Engineer-In-charge for approval before commencing the work.

14 Liability for damage to works or plant

14.1 The Contractor shall during the progress of the works properly cover up and protect the work place and plant leased by BMRCL from injury by exposure to weather and shall take every reasonable proper and timely precautions against accidents or injury to the same from any cause, and shall be answerable and liable for all accidents or injuries resulting there from or occasioned by the Acts or omissions of the Contractor or his workmen or Subcontractor and shall indemnify the employer for all losses and damages to the works or plant arising from such accidents or injuries.

15 Labour conditions

15.1 The Contractor shall comply with the labour laws in force and shall furnish the returns and information as may be specified from time to time. He shall not employ or engage migrant labourers without express permission of the Engineer- in- charge.

15.2 The Contractor shall as far as possible obtain his requirements of labour from the local area, and through the employment exchanges wherever so required by law. The Contractor shall pay fair and reasonable wages as prescribed under Minimum wages Act 1948 (whether or not such wages are controlled by any law existing at the time) to workmen employed by him for the work

15.3 The Contractor shall provide at his own cost, suitable shelters at the work spot for meals and arrange for supply of clean, safe, potable water to his workmen. Where women are employed in numbers more than 50 at a spot, the Contractor shall arrange for "Crèches". The Contractor may be permitted, if he finds it necessary, to work on Sundays subject to the provisions of labour Act with the prior consent of the Engineer-in-charge and after giving the intimation at least two days in advance.

16 Medical facilities for labourers

16.1 The Contractor shall arrange to build at his own cost proper camp for his labourers and provide such camps with facilities of clean potable treated water and light (where ever possible) and arrange for drainage and proper disposal of sewage. He shall abide by the rules framed on this behalf by the Engineer-in-charge or the Health Office / Environment officer on the project.

16.2 The Contractor shall also provide at his own cost for the Medical supervision of his workmen against epidemics & arrange for taking anti malaria measures, vaccination against small pox, typhoid, cholera, etc., and examination of persons employed.

16.3 The Contractor shall also at his own cost provide for first aid at the work spot and for medical aid at his main camp to all his employees as directed by the Health Officer / Environment Officer and submit reports regarding such conditions in the camps.

17 Materials, workmanship etc.,

The work shall be executed in a thoroughly standard manner with materials and workmanship of the best quality and strictly in accordance with the specifications and drawings or written instructions as may from time to time be furnished to the Contractor and shall be completed in every respect with all materials and workmanship implied and necessary according to the fair interpretation and meaning of the same. Should there be any discrepancy between the drawing and specifications or any difference or dispute as to the dimensions to be worked to or the periodical quantity to be executed or with respect to any subject arising out of this Contract, the decision of the Engineer-in-charge shall be final and binding on all parties.

18 Material Procurement:

The Contractor shall procure the materials from BESCOM/ KPTCL/BMRCL approved vendors only conforming to the Guaranteed Technical Specifications/Parameters as laid out by BMRCL/BESCOM.

19 Contractor to inform engineer-in-charge the arrangements made by him for the execution of work.

19.1 The Contractor shall furnish schedule of work and the CPM/PERT chart in / MS Project for carrying out the work and the same shall be followed during execution.

19.2 The Contractor shall furnish the Engineer-in-charge a statement in writing of the arrangements he proposes to adopt for the execution of the work and in case the Engineer-in-charge considers any alterations in the same desirable, the Contractor shall on notice thereof adopt such alteration.

19.3 The Engineer-in-charge and his authorized assistants or agents shall have, at all times, full power to inspect the works wherever in progress either on the site, or at the Contractor's premises wherever situated on the premises of any firm or company where work in connection with this Contract may be done and the Contractor shall provide all reasonable facilities and safety devices, at his own cost, for enabling such an inspection of works to be carried out, and any tests to be conducted if necessary. The Contractor shall maintain at such work spot a Work Order book, in which the instructions in the said Work Order, shall be promptly noted and sent to the inspecting Officer and provide a copy of the same to the Engineer-in-charge.

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20 Opening out of the works

Should the Engineer-in-charge consider it necessary in order to satisfy himself as to the quality of work, the Contractor shall at any-time during the execution of the work, pull down or cut into any part of the work and make such openings into and to such an extent through the same as the Engineer-in-charge may direct and the Contractor shall make good the whole of Work at his own cost.

21 Removal of imperfect work

21.1 If any work has been executed with unsound, imperfect for unskilled workmanship or with materials of any inferior quality not in accordance with the specifications and drawings, the Contractor shall at his own cost rectify, reform, remove and reconstruct the same either in whole or part as may be directed by the Engineer-in-charge, whether or not the value of any such work (or materials) shall have been included in any payment made to the Contractor.

21.2 Should the Engineer-in-charge consider in his unfettered discretion that he could accept a work which is not strictly in accordance with the Contract documents but is structurally sound and would serve the purpose for which it is executed, he may fix a price less than that Contracted for, and his decision regarding the acceptance and the reduced price to be paid for, shall be final and binding on the Contractor.

22 Suspension of work

22.1 The Engineer-in-charge may from time to time by direction in writing without in any way vitiating the Contract, direct the Contractor to suspend the works or any part thereof at such time or times and so long as the Engineer-in-charge may deem desirable, and the Contractor shall not after receiving such written notice proceed with the works therein ordered to be suspended until he shall have received a written notice or authority from the Engineer-in-charge to proceed with the works.

22.2 Should the works be ordered to be suspended directly or indirectly as a result of the Contractor not complying with any of the provisions of the Contract in respect of the quality of the materials, workmanship, progress, mode of execution, the order of execution etc., or in the interest of safety of the works, or due to acts of nature, force majeure or war, the Contractor shall not be entitled to claim any compensation for any loss he may be put to. If however, the works be ordered to be suspended for reason for which the Contractor is not responsible directly or indirectly he will be entitled to compensation as may be determined by the Engineer-in-charge whose decision in the matter shall be final. In such matters the profits that the Contractor would have earned had the work not been suspended shall not be taken into consideration.

23 Access to site and work on site

BMRCL may, if it deems fit from time to time, enter upon any land which may be in the possession of the Contractor under this Contract for the purpose of executing any works by itself or through its agents or through the other Contractors or workers of BMRCL at its option, and the Contractor shall in accordance with the directions of the Engineer-in-charge afford all reasonable facilities for the execution of the works, including the Occupation of lands by structures or otherwise for any Contractors or their workmen or for BMRCL- workers who may be employed in the execution of Works, on or near the site of work not included in this Contract or any Contract in connection with or ancillary to such work and in default the Contractor shall be liable to compensate BMRCL for any delay or expense incurred by the reason of such default. Provided always that if the exercise of these powers, shall cause any damage

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to the Contractor he may as and when damage shall arise make a statement of the same to the Engineer-in-charge who shall from time to time certify to BMRCL, the value in his judgment of such damage & BMRCL shall from time to time pay the Contractor the amount if any so certified by the Engineer-in-charge.

24 Deviations, alterations etc., in the works

24.1 The Contractor shall not in any way alter any part of the work in respect of design, quantity, material or specification, without the written consent of the Engineer-in-charge, but the Engineer-in-charge may from time to time or at any time during the progress of the works direct in writing any deviations, addition, omissions, or alterations, to be made in or to the works or any part thereof in respect of quantity, design, material, workmanship and or specifications and may direct the Contractor to curtail or omit any of the works or to commence and execute any new or substituted work in such order and manner as he may deem fit and any such direction of the Engineer-in-charge and any such deviation alteration, addition and omissions made in pursuance thereof shall not violate the Contract or be made the ground for any claim for compensation for alleged loss or profit in respect of omitted works or for extra rate of payment for additional works.

24.2 In the event of any disputes arising out of the validity of the claims or as to the amount to be paid or allowed in respect thereof, the decision of the Engineer-In-Charge shall be final and binding and in the mean while the Contractor shall either proceed with or stop the works as may be ordered by the Engineer-in-charge.

25 Measurement and terms of payments

25.1 The Contractor shall submit an invoice / Bill in quadruplicate (4 copies) to the Engineer-in-charge in prescribed form. Such Payment will be made after item wise measurements for different works as recommended by the Engineer-in-charge as per the Contract.

25.2 The payments to Contractor are subject to recoveries, which are due from the Contractor as indicated in Clause 26.7 of this section.

25.3 The authorized representatives of the Engineer-in-charge and the Contractor shall jointly take the measurements. The representative of the Engineer-in-charge will give a week's notice to the Contractor of his intention to record the measurement immediately on report of completion of all works by the Contractor and if the Contractor's representative fails to join the Engineer-in-charge representative, the latter may proceed with the measurements by himself and the Contractor shall have to accept these measurements as correct and binding on him.

25.4 On the basis of these joint measurements, payment will be made to the Contractor by the Engineer-in-charge according to the procedure prevalent in BMRCL and as far as possible within **28 working days** after submission of the bills & after recording the measurements as stated above.

25.5 Wherever approval of the Inspectorate authorities is required under statute, payment shall be made by the Contractor and reimbursed by BMRCL on production of bills/vouchers.

25.6 All materials and work for which payment is made in part or full shall become the sole property of BMRCL, but this provision shall not relieve the Contractor of his responsibility for the care and protection of the materials and works at his own cost and his liability to make good the damage if any unless and until the whole work is deemed to have been completed, commissioned and handed over to BMRCL, in accordance with the terms and conditions of the Contract.

25.7 The periodical measurements and payments will not entitle the Contractor to any claim that the works for which payment has been made are accepted as complete in accordance with the specifications, drawings or other Contract documents and in no way will curtail the right of the Engineer-in-charge to subsequently direct the removal of imperfect work or pay at a lower reduced rate, or to re-measure the works.

25.8 These periodical payments shall be treated only as advance on account to be adjusted finally after the works are finally measured on completion and the final bill is prepared.

25.9 The Contractor shall not be entitled to claim any interest upon any arrears or upon any balance, which may be found due to him at any time.

25.10 **Stages of payment:**

The terms of Payments will be as stated below:

(a) Sixty percent (60%) of the invoice price excluding the GST of the materials supplied to store/site on receipt after supply of Turnkey Materials subject to the Certification by the concerned Engineer-in-charge with submission of the following:

i) Contractor's Detailed Invoice.

ii) Pre-dispatch clearance certificate issued by the owner, prior to dispatch of the Consignment.

iii) Physical Verification Certificate by the site Engineers.

iv) Test Certificates.

v) The vendor's invoice/ delivery challan.

vi) Copy of the Certificate of Transit Insurance.

vii) Indemnity Bond and Storage Insurance.

(b) Thirty percent (30%) of the Ex-works material cost shall be paid based on erection, laying of UG cable of equipment and all other associated works in complete manner, ready for commissioning in all respect to the satisfaction of the Engineer-In-Charge.

The above Payment terms are subject to the following conditions stated herein below:

i) The Paying authority shall ensure before making any payment towards materials that the materials have been received at site.

ii) The work is going according to the plan.

iii) Notwithstanding anything contained to the contrary in the Tender documents, storage insurance for materials stored at the site by the Contractor shall be to the account of the Contractor alone and no amount whatsoever is payable by BMRCL.

(c) Balance Ten percent (10%) of Ex-works material cost shall be paid after commissioning of the subject to the Certification by the concerned Engineer in charge and handing over to BESCOM / BMRCL authorities.

(d) Labour charges for cables laying, termination etc will be paid 100% on completion of the work, in all respects.

i) The Engineer-in-charge ensures that the work has completed in all respects as per Tender Conditions except Commissioning.

ii) On certification of the Engineer-in-charge after duly having joint Measurements along with the Contractor.

BMRCL

26 Taxes and duties

26.1 Contract prices shall be inclusive of all applicable taxes, duties levies and cess including taxes to be deducted at source, insurance and exclusive of SGST and CGST. BMRCL shall pay the SGST and CGST as applicable as per laws.

26.2 Income tax and other statutory deductions of the State & Central Government as applicable from time to time shall be made from the Contractor's Bills & directly remitted to concerned department by BMRCL. If the income tax is to be deducted at lower rate, then the Contractor has to furnish a lower deduction certificate issued by the jurisdictional IT authorities.

26.3 The Contractor shall maintain complete records in respect of payments made by them as required by law.

26.4 The Contractor shall furnish along with the 2nd and subsequent bills copies of all the purchases of Goods and Services made within the State of Karnataka.

26.5 BOCW cess at the rate of 1% of the Total Bill Amount as per "The Building and Other Construction Workers Cess act 1996" shall be deducted from each Interim Payment Certificate (IPC) of the Contractor.

26.6 **NOT USED**

26.7 **Recoveries**

26.7.1 Recoveries due from the Contractor up to the end of the month previous to the one in which bill is prepared shall be made from the bills approved for payment every month in the following order of priority and extent.

a) Penalty, in full, if any to be levied.
b) Expenditure incurred by BMRCL on behalf of the Contractor in full.
c) Charges for services such as water supply, power etc., if any, rendered by BMRCL in full.
d) Statutory deductions like Income Tax etc;
e) Any recoveries or other sums due from the Contractor to BMRCL.

26.7.2 The extent of recovery to be made from the Contractor's bill may be modified at the discretion of the Engineer-In-Charge, if the bill under question includes items whose rates are not finalized or the rate for such items is not fully collected.

27 Date of completion

27.1 The works shall be completed in all respects within the period specified in Appendix to Form of Tender (Section V) including monsoon period.

27.2 The necessary PERT Chart duly indicating the completion of each stage of work on Individual sections and the total completion period according to delivery schedule shall be furnished, to the Engineer-in-charge.

27.3 The Contractor shall supply, erect, equip and construct the whole of the works to the satisfaction of authorities with all certification and hand them over to BMRCL O&M on or before the date or dates specified as incorporated in the Contract Agreement. Provided always that if, in the opinion of the Engineer-in-charge, any alteration, addition, subtraction or modification of the work due to any strike or

lockout of any workmen employed by the Contractor or by causes directly due to war or the unforeseen acts of nature or due to actions caused by BMRCL by issuing any orders, drawings, instructions or directions in time or by the suspension of work, the Engineer-in-charge, if in his discretion deem fit, either forthwith or at any later time and from time to time not withstanding that the prescribed or extended time for completion has expired or that the works have been completed, by writing extend the time for the completion of the work to such date as he may deem fit and proper, provided always that the Contractor makes a written application to the Engineer-in-charge at or before the time when the cause of the delay is occurring or about to occur or within three days from the occurrence of such delay. Unless the time is extended by the Engineer-in-charge, the prescribed time may not be extended not withstanding delays from the foregoing or any other cause of whatever kind. However, the Contractor shall not be responsible for delay due to accordance of approval by the Inspectorate. In such a case, where the Contractor is entitled for the extension of time, no monetary claims whatsoever shall be paid or entertained on this account.

27.4 The Employer shall give possession of all parts of the site progressively for the completion of works to the contractor, if, possession of part of the site is not given by the date stated in the contract or Notice to proceed / LOA, the reasonable extension of time may be given. However, no monetary claims whatsoever shall be paid to the contractor or entertained on this account. The delay in access to site shall not be considered as "Breach of Contract".

28 Progress of work and failure to abide by the programme of work and penalties thereof

28.1 The time allowed for carrying out the work as per program shall strictly be observed by the Contractor as set out in the Tender document / agreement. The work shall throughout the stipulated period of Contract proceed with all due diligence, time being deemed to be the essence of the Contract on the part of the Contractor. If the Contractor at any stage of the progress fails to complete the work, the Engineer-in-charge shall be at liberty to adopt any one of the following courses after sending written notice to the Contractor.

28.2 To employ labour paid by BMRCL, to supply materials to carry out the work or any part of the work, debiting the Contractor with the cost of labour, transportation, price of materials etc., (as to the correctness of such cost and price, the decision of the Engineer-in-charge being final & conclusive against the Contractor) and crediting him with the value of work done in all respects in the same manner and at the same rates as if it has been carried out by the Contractor under the terms of his Contract and in that case, certificate of the Engineer-in-charge as to the value of the work done being final and conclusive against the Contractor.

28.3 In case the Contractor abandons the work or does not execute the work as per the Contract conditions, BMRCL would get the works executed by another agency at the "risk and cost" of the Contractor.

28.4 In order for the work of the Contractor to be measured and to take such part, thereof, as shall be unexecuted out of his hands and to give to another Contractor to complete the same in which any expense which may be incurred in excess of the same, which would have been paid to the original Contractor, if the whole work had been executed by him (as to the amount of which excess expenses, the decision of the Engineer-in-charge shall be final and conclusive) shall be deducted from any money

due to him by BMRCL under the Contract or otherwise from his Earnest Money, further Security Deposit etc.,

28.5 To allow the original Contractor to continue the work, levying the penalty as per rates noted below for the number of days that the Contractor takes to complete and deliver portion of the work which was scheduled to be completed as per program in the agreement.

29 Penalty for delay in execution of the work

29.1 The penalty shall be one (1) percent of the Original Contract Price per week of delay or part thereof subject to a maximum of 10% on the portion of work which is not completed for beneficial use within the time stipulated in clause 27 above.

a) The period(s) of continuance of delay, if any, beyond 10 weeks shall be at the sole discretion of the Engineer-in-charge. If the Contractor still fails to complete the work within such extension period, the Contractor shall be liable for paying the liquidated damages/penalty as decided by BMRCL.

b) Penalties levied for the following:

(i) Non-fulfillment of program of works within the stipulated period.

(ii) The number of days allowed beyond the stipulated period for completing the work and

(iii) Extra cost that might be incurred by BMRCL for getting the balance work completed through any other agency as it deems fit under the circumstances will be deducted from money due to him by BMRCL for work done under the Contract or otherwise.

c) The levy of penalty is however exempted, if extension of time granted for the execution of work for valid reasons.

30 Compliance with instructions

30.1 If the Contractor fails to work with diligence and expedition, or shall refuse or neglect to comply with any reasonable orders given to him in writing by the Engineer-in-charge in connection with the work or contrivances of the provisions of the Contract, BMRCL may give "seven days" notice in writing to the Contractor, to make good the failure, neglect or contravention complained of, and should the Contractor fail to comply with the notice within the specified time from the date of service thereof in the case of a failure, neglect or contravention, capable of being made good within that time or otherwise within such time as may be reasonably necessary for making it good, then and in such case BMRCL shall be at liberty to employ other workmen and forthwith perform such work as the Contractor may have neglected to do or if BMRCL shall deem fit it, shall be lawful to take over the work wholly or in part of the Contractor's hands and reconstruct the work or any part and in that event, BMRCL shall without being responsible to the Contractor for the fair wear and tear of the same have the free use of all the materials, tools, tackle, construction plant or other things for use at any time in connection with the work to the exclusive of any right of the Contract over the same and BMRCL shall be entitled to retain and apply any balance amount which may be otherwise due on the Contract to the Contractor including Earnest Money, Security Deposit and retention money, if any, for the performance of the Contract, or such part thereof as may be necessary to the payment of the cost of executing such work as aforesaid.

31 Powers to take over plant and equipment to enforce progress

31.1 Notwithstanding anything contained in the clause herein above, if the Contractor fails to work with due diligence and speed or refuses or neglects to comply with any lawful and reasonable orders given to him in writing by the Engineer-in-charge or contravenes any of the provisions of the Contract, the Engineer-in-charge may give seven days' notice in writing to the Contractor to make good the failure, neglect or contravention complained of and should the Contractor fail to comply with the notice within the time specified in the notice, then in case the Engineer-in-charge shall be at liberty to employ other workmen and forthwith perform such work as the Contractor may have neglected to do, or if deemed fit, it shall be lawful for the Engineer-in-charge to take the work wholly or in part, out of the Contractors' hands and reconstruct it at a reasonable price with any other person or persons or provide any other materials, tools and tackle or labour for the purpose of completing the work and in such an event the Engineer-in-charge shall without being responsible to the Contractor for fair wear and tear, have the free use of all materials, tools, tackle, plant or other things including operating personnel which may be on the site for the use at any time in connection with the work to the exclusive of the right of the Contractor, over the same and the Engineer-in-charge shall be entitled to retain and appropriate and balance which may otherwise be due to the Contractor as may be necessary to the payment of the cost of executing such works aforesaid.

31.2 If the cost of executing the work as aforesaid exceeds the balance due to the Contractor and the Contractor, fails to make good the deficit, the said materials, tools, tackle, plant or other things, which were the property of the Contractor, may be sold by the Engineer-in-charge and the proceeds thereof applied towards the payment of such difference and cost of any incidental to such sale, shall be paid by the Contractor forthwith but when all expenses, costs and all charges incurred in the completion of the works are paid by the Contractor, all such materials, tools, tackle, construction plant or other things, remaining unsold may be allowed to be removed by the Contractor.

32 Termination of contract

32.1 BMRCL shall have the powers:

a) To recover from the Contractor as agreed liquidated damages or by way of penalty clause above and to purchase elsewhere/complete the works after giving due notice to the Contractor, on to the account and at the risk of the Contractor, such stores/works not so delivered/completed or others of a similar description without canceling the Contract in respect of the consignment/work not yet due for delivery, but the Supplier/Contractor shall not be entitled to any savings on such purchases/works made against default.
b) To cancel the Contract.
c) To forfeit Performance Security.
d) To blacklist or not to consider the Contractors future offers for a specified period or such other periods as decided by BMRCL.

32.2 **Termination for Convenience**

32.2.1 BMRCL may, by a written notice of 14 days sent to the Contractor, terminate the Contract, in whole or in part at any time for its convenience. The notice of termination shall specify the termination is for BMRCL's Convenience, the extent to which performance of work under the Contract is terminated and the date upon which such termination is effective.

BMRCL

32.2.2The Contractor upon receipt of such notice shall discontinue the work on the date and to the extent specified in the notice, make all reasonable efforts to obtain cancellation of all orders and the Subcontracts to the extent they are related to the work terminated and upon terms satisfactory to BMRCL.

32.2.3After termination, the Employer (BMRCL) may complete the works and arrange for any other entities to do so at the risk and cost of the Contractor. The Employer and his entities then may then use the working area, Contractors documents and his any other related documents made by or on behalf of the contractor.

On termination of the Contractor's default, the Employer shall be entitled to:

a. Forfeit the whole or such portion of the Performance Security amount as it may consider fit, and
b. Recover from the Contractor the cost of carrying out the balance work in excess of the sum which he would have been paid according to the certificate of the Engineer, if the works had been carried out and completed by the Contractor under the terms of Contract. Such certificate shall be final and binding upon the Contractor. The amount to be recovered may be deducted by the Employer from any monies then due or which, at any time thereafter, may become due to the Contractor under this or any other Contract or otherwise.

33 Force majeure

33.1 For the purposes of the Contract "Force Majeure" means, an event which could not reasonably have been avoided by a diligent party in the circumstance, which is beyond the reasonable control of a party and which makes the performance of an obligation as to impossible in the circumstances and includes, but is not limited to, war, riots, civil disorder, earthquake, storm, flood or other adverse weather conditions strikes, lockouts or other industrial action, Electrical Grid failure, confiscation or any other action by Government agencies.

33.2 Force majeure shall not include any event, which is caused by the negligence or intentional action of a party or such party's Subcontractors or agents or employment, or by a failure to observe good Engineering practices.

33.3 Force Majeure shall not include insufficiency of funds or failure to make any payment required hereunder.

34 Completion & final certificate

34.1 As and when the whole work is completed to the satisfaction of the Engineer-in-charge in accordance with the conditions of this Contract, the Engineer-in-charge shall issue a Completion Certificate and the Engineer-in-charge shall take over the work included in the completion certificate.

34.2 The Contract shall not be considered as complete until a final certificate is issued by the Engineer-in-charge, to the effect that the Contractor has fulfilled all the obligations in the manner provided in the Contract not withstanding any previous entry on the works or taking possession of works or using any part of the work by BMRCL. Final completion certificate shall be issued within one month soon after handing over of completed work and return of all the released material to BMRCL, physical completion/Commissioning of the work and submission of final as built drawings by the contractor duly attested by BMRCL Engineer In-charge.

35 Guarantee of works / Defects Liability Period (DLP)

35.1 For a period of Twelve (12) months from the date of issue of the completion certificate herein above mentioned, the Contractor shall be liable for the works or any portion thereof found to be defective for causes arising from faulty materials or workmanship or other causes for which in the judgment of BMRCL, the Contractor is responsible. He shall make good any damages arising there from, notwithstanding the fact that the completion certificate may have been issued and the security deposit refunded.

36 Death, bankruptcy etc.

36.1 If the Contractor dies or becomes bankrupt or being a firm commences winding up except for reconstruction purposes or carries on its business under a receiver, the executors, successors or other representatives in law, the liquidator or any person in whom the Contract may become vested, shall forthwith give notice thereof in writing to the Engineer-in-charge and shall take all reasonable steps to prevent stoppage of works for one month during which period he shall guarantee as the Engineer may require but not exceeding the period of option in the event of stoppage of works, the period of option shall be fourteen days only. Provided that, should the above option not be exercised, the Contract may be terminated by the Engineer and any money pending with BMRCL may be forfeited, except in case of termination caused by the death of the Contractor.

37 Insurance

37.1 The Contractor at his Cost shall arrange, secure and maintain all Insurance as may be pertinent to the Works and obligatory in terms of law to protect his interest and interests of the Owner against all perils detailed herein. The form and the limit of such Insurance as defined herein together with the under-writer in each case shall be acceptable to the Owner. However, irrespective of such acceptance, the responsibility to maintain adequate Insurance Coverage at all time during the period of Contract shall be of Contractor alone. The Contractor's failure in this regard shall not relieve him of any of his Contractual responsibilities and obligations. The Contractor shall, however, be authorized to deal directly with Insurance Company or Companies and shall be responsible in with regard to maintenance of all Insurance covers. Further the Insurance in Indian Rupees.

37.2 Any loss or Damage to the Equipment during handling, transportation, Storage, Erection, putting into satisfactory operation and all activities to be performed till the successful completion of Commissioning of the Equipment shall be to the account of the Contractor. The Contractor shall be responsible for preference of all Claims and make good the Damages or loss by way of repairs and/or replacement of the Equipment, Damaged or lost. The transfer to title shall not in any way relieve the Contractor of the above responsibilities during the period of Contract. The Contractor shall provide the Owner with copy of all Insurance policies and Documents taken out by him in pursuance of the Contract. Such copies of Documents shall be submitted to the Owner immediately after such Insurance coverage. The Contractor shall also inform the Owner in writing at least sixty (60) Days in advance regarding the expiry /cancellation and/or change in any of such Documents and ensure revalidation, renewal etc., as may be necessary well in time.

BMRCL

Contractor

37.3 The perils required to be covered under the Insurance shall include, but not be limited to fire and allied risks, miscellaneous accidents (Erection risks) Workman compensation risks, loss or damage in transit, theft, pilferage, riot and strikes and malicious damages, civil commotion, weather conditions, accidents of all kinds, etc. The Scope of such Insurance shall be adequate to cover the Replacement/ Reinstallation Cost of the Equipment for all risks up to and including delivery of Goods and other Costs till the Equipment is delivered at Site. The Insurance policies to be taken should be on replacement value basis and/or incorporating escalation Clause. Notwithstanding the extent of Insurance cover and the amount of Claim available from the underwriters, the Contractor shall be liable to make good the full replacement/ rectification value of all Equipment/Materials and to ensure their availability as per Project requirements.

37.4 All Costs on account of Insurance liabilities covered under the Contract will be on Contactor's account and will be included in Contract Price. However, the Owner may from time to time, during the pendency of the Contract, asks the Contractor in writing to limit the Insurance coverage, risks and in such a case, the Parties to the Contract will agree for a mutual settlement, for reduction in Contract Price to the extent of reduced Premium amount. The Contractor, while arranging the Insurance shall ensure to obtain all discounts on Premium that may be available for higher Value or for reason of financing arrangement of the Project.

38 Jurisdiction of court in case of dispute or differences arising on account of this tender

Any suit or application, arising out of any dispute or differences on account of this Tender, shall be filed in a competent court at Bangalore only and no other court or Forum or Tribunal shall, have any jurisdiction in the matter.

39 Penalty for offering illegal gratification to BMRCL employees

If the Contractor or any of his servants or agents, directly or indirectly gives promise or offers any bribe, gratuity, gift, loan, perquisite, reward or employment of BMRCL or in any other way directly or indirectly tries to influence the action of such an employee, in any way relating to his office or employment, the Contract shall be liable to be rescinded. In the event of the Contract being rescinded, the Security deposit of the Contract shall stand forfeited to BMRCL and further the work remaining unexecuted shall be carried out at the cost and risk of the Contractor. Such Contractor will be blacklisted and will not be permitted to participate in any future Tenders of BMRCL.

40 Breach of the part of BMRCL not to affect the contract

Breach or Non observance of any of the conditions or terms of the Contract by **BMRCL**, shall not entitle the Contractor to rescind the Contract, but he shall only be entitled to claim damages for loss incurred by him in accordance with law.

41 Law and language

The Contract shall be governed by the Acts and Laws of India, the rules, regulations and bye-laws of the concerned public bodies and authorities. Language of the Contract shall be English.

42 Corrupt or fraudulent practices

42.1 The Employer requires that the Tenderers / Suppliers / Contractors under this Contract, observe the highest standard of ethics during the procurement and execution of this Contract. In pursuance of this policy the Employer:

a) Defines, for the purpose of these provisions, the items set forth below as follows:

i. "Corrupt Practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution; and

ii. "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a Contract to the detriment of the Employer, and includes collusive practice among Tenderers (prior to or after Tender submission) designed to establish Tender prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

b) Will reject a proposal for award of work if he determines that the Tenderer Recommended for award has engaged in corrupt or fraudulent practices in competing for the Contract in question.

c) Will declare a Tenderer ineligible, either indefinitely or for a stated period of time to be awarded a Contract/ Contracts if he at any time determines that the Tenderer has engaged in corrupt and fraudulent practices in competing for, or in executing, the Contract.

42.2 BMRCL and each Tenderer submitting the Proposal shall comply with these conditions of Tender and in their dealings with each other, discharge their duties and obligations on time and with integrity and behave equitably, honestly and transparently.

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SECTION - IV

SPECIAL CONDITIONS OF CONTRACT (SCC)

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SECTION-IV - SPECIAL CONDITIONS OF CONTRACT (SCC)

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SECTION – IV: SPECIAL CONDITIONS OF CONTRACT (SCC)

This Special Conditions of Contract (SCC) shall be read in conjunction with General Conditions of Contract (GCC), Section-III. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

1 Brief description of the work

BMRCL has proposed for **"Shifting of Uncharted BESCOM Electrical Utilities of HT/LT UG Cables, RMU's and Transformer Centers which are infringing Elevated & Underground Metro Alignment in All Reaches of Phase - 2 of BMRCL Project"** of Bangalore Metro Rail Project.

2 General

The Works are handled by the concerned Engineer-in-charge and will be assisted by authorized Officer for monitoring the proper execution of all the works and for measurement of works executed by the Contractor.

3 Brief scope of work

3.1 The brief scope of work is shifting of uncharted BESCOM Electrical Utilities which includes, but not limited to

i. Supply, Laying, Jointing, Testing and commissioning of 11kV UG cables & RMUs, shifting of transformer centers & other electrical equipment's etc.....

ii. Design and Detailed Engineering to match the new cable and cables accessories with the existing UG cable system under employer's requirement.

iii. Complete Manufacture including Shop Testing of Equipment's/Materials in the Scope of the Contractor after availing the BESCOM approved Vendors.

iv. Providing Engineering Drawings, Data, Operation Manual, etc for BMRCL's approval for the Equipment's/Materials in the Scope of the Contractor.

v. Packing and Transportation from the Manufacturer's Works to the Site of Equipment's/Materials in the Scope of the Contractor.

vi. Receipt, Storage, Preservation and Safe keeping of Equipment at the Site.

vii. Pre-assembly, if any, Erection, Testing and Commissioning of all the Equipment.

viii. Reliability Tests and Performance and Guarantee Tests on Completion of Commissioning.

3.2 Not used.

3.3 The details of equipment to be supplied, transported, erected, assembled, tested & commissioned are indicated in BOQ / Pricing Document. The quantities indicated in the BOQ / Pricing Documents are only approximate and may increase or decrease and prices quoted by the Tenderer are deemed to be valid in spite of such variations subject to SCC Clause 10.

3.4 Any other items not specifically mentioned but which are essentially required for satisfactory performance & completeness of work, shall be deemed to be included in the scope of specifications and works and the same shall be executed / carried out by the Tenderer at no extra cost to BMRCL.

4 Standards:

4.1 Unless otherwise stated, all equipment / materials to be supplied and used under this Contract shall be new. All equipment / materials to be supplied / provided and work to be performed under the

specifications shall in general conform to the latest issues including amendments of the B.I standards mentioned under respective equipment's heads.

4.2 For materials in respect of which no specifications have been indicated, such materials shall conform to the latest Indian Standard or in its absence, any other International Standard.

4.3 All materials used should be BMRCL / BESCOM approved makes and work should be executed as per BMRCL requirement.

5 General requirements

5.1 All equipment/materials shall be submitted for inspection by a duly authorized representative of the Engineer-in-charge. Inspection may be made at any stage of manufacture, dispatch or at site or at these places at the option of the Engineer-in charge and the equipment dispatched/about to be dispatched, if found unsatisfactory as to workmanship or quality, the same is liable to be rejected. The successful Tenderer / Contractor shall grant free access to the places of manufacture to the authorized representative of the Engineer-in-charge at all times when the works related to the manufacture are in progress.

5.2 Inspection and acceptance of any equipment / materials under the specifications by the Engineer-in-charge or his authorized representative shall not relieve the Contractor of his obligations of furnishing / supplying the equipment in accordance with the specifications.

5.3 All equipment / materials being supplied by the Contractor shall conform to the Type tests and shall be subject to Routine tests in accordance with relevant standards.

5.4 Type tests and routine tests on the equipment / materials being supplied, whenever specified shall be carried out in accordance with relevant standards, at the Contractor's cost. Copies of all routine test certificates of the following equipment shall be furnished to the Engineer.

5.5 Routine tests shall be witnessed at the manufacturer's premises in respect of the above materials by the representative of BMRCL.

5.6 The Contractor shall issue at least 7 days clear notice of routine tests to be conducted with details of time, place and venue to facilitate the representative of the Engineer to witness and certify such tests. In case any of the material is rejected during such test, the Contractor shall pay a penalty of Rs. 20,000.00/- (Rupees Twenty Thousand only) for each such failure when attended by the Engineer-in-Charge's representative.

5.7 For all other materials, not specifically mentioned above, the test certificate with regard to Type test and Routine Tests shall be furnished before the same are used for the works. The inspection and certification by the representative of the Engineer at the manufacturer's premises is not mandatory for such materials.

5.8 BMRCL reserves the right of getting any field test conducted on completely assembled equipment at site.

5.9 The Contractor is fully responsible for the Equipment / Material until the same is handed over to BMRCL in an operating condition after Commissioning. The Contractor is responsible for the proper maintenance of equipment / material as well as protection of the same against theft, elements of

nature, damages etc., while in his custody as well as after erection until the same is taken over by BMRCL / concern department under due acknowledgment in writing.

5.10 The entire works to be executed under this Contract will be in stages & requires obtaining Line Clear Permits from the Engineer-in-charges representative or his subordinate before taking up the works by the Contractor from BMRCL / BESCOM. As such the Contractor shall take all mandatory safety precautions for executing the works & shall obtain Line Clear Permits with the Operational Authorities of the area prior to commencement of works on daily basis.

5.11 The work shall be carried out as per the direction of BMRCL Engineer in-charge. After the completion of Electrical work, the contractor shall check the functionality of BMRCL/BESCOM Guidelines during warranty period once in a fortnight and submit the report to Engineer in-charge/office of the Chief Engineer (U/S) BMRCL. The Tenderer should have an office / service center in Bangalore.

6 Acceptance of supplies

6.1 All or any articles / equipment / materials supplied against this Contract will be subject to the inspection and approval of BMRCL and/or any other officer deputed for the purpose.

7 Claims, Disputes, Conciliation and Arbitration

7.1 **Procedure for Claims**

If the Contractor intends to claim any additional payment under any clause of these Conditions or otherwise, the Contractor shall give notice to the Engineer as soon as possible and in any event within 30 days of the start of the event giving rise to the claim.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at any other location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer shall, on receipt of such notice, inspect such records and may instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all such records, and shall (if instructed) submit copies to the Engineer.

Within 30 days of such notice, or such other time as may be agreed by the Engineer, the Contractor shall send to the Engineer an account, giving detailed particulars of the amount and basis of the claim. Where the event giving rise to the claim has a continuing effect, such amount shall be considered as interim. The Contractor shall then, at such intervals as the Engineer may reasonably require, send further interim accounts giving the accumulated amount of the claim and any further particulars. Where interim accounts are sent to the Engineer, the Contractor shall send a final account within 30 days of the end of the effects resulting from the event.

If the Contractor fails to comply with this Sub-Clause, he shall not be entitled to claim any additional payment.

7.2 **Amicable Settlement**

The Employer and the Contractor shall make every effort to resolve amicably through negotiation, any disagreement or dispute arising between them under or in connection with the Contract.

7.3 **No legal action till Dispute settlement procedure is Exhausted**

Any and all Disputes shall be settled in accordance with the provisions of Clause 7. No action at law concerning or arising out of any Dispute shall be commenced unless and until all applicable Dispute resolution procedures set out in Clause 7 shall have been finally exhausted in relation to that Dispute

or any Dispute out of which that Dispute shall have arisen with which it may be / may have been connected.

7.4 **Notice of Disputes**

For the purpose of Sub-Clause 7.5, a Dispute shall be deemed to arise when one party serves on the other party a notice in writing (hereinafter called a "Notice of Dispute") stating the nature of the Dispute provided that no such notice shall be served later than 28 days after the date of issue of Performance Certificate by the Engineer.

7.5 **Two Stages for Dispute Resolution**

Disputes shall be settled through two stages

a) Conciliation procedures as established by "The Arbitration and Conciliation Act-1996" (as amended from time to time) and in accordance with this Clause. In the event this procedure fails to resolve the Dispute then;

b) Arbitration procedures undertaken as provided by "The Arbitration and Conciliation Act -1996" (as amended from time to time) and in accordance with this Clause.

7.6 **Conciliation**

Within 60 days of receipt of Notice of Dispute, either party shall refer the matter in dispute to conciliation.

Conciliation proceedings shall be initiated within 30 days of one party inviting the other in writing to Conciliation. Conciliation shall commence when the other party accepts in writing this invitation. If the invitation is not accepted, then Conciliation shall not take place. If the party initiating conciliation does not receive a reply within 30 days from the date on which he sends the invitation, he may elect to treat this as a rejection of the invitation to conciliate and inform the other party accordingly.

The Conciliation shall be undertaken by one Conciliator selected from a panel of Conciliators maintained by the Employer. The Conciliator shall assist the parties to reach an amicable settlement in an independent and impartial manner.

7.7 **Conciliation Procedure**

The Employer shall maintain a panel of Conciliators with requisite qualifications and professional experience who shall be from serving or retired Engineers of Government Departments, or of Public Sector Undertakings. Out of this panel, a list of three Conciliators shall be sent to the Contractor who shall choose one of them to act as Conciliator and conduct conciliation proceedings in accordance with "The Arbitration and Conciliation Act, 1996", of India. The party serving notice of dispute on the other party shall also serve such notice on the Conciliator chosen as per this Clause. The Employer at the time of offering the panel of Conciliators to be appointed as Conciliator shall also supply the information with regard to the qualifications of the said Conciliators nominated in the panel along with their professional experience, phone nos. and addresses to the Contractor.

In the event of the Contractor not choosing the Conciliator from the panel furnished by the Employer, within a period of 30 days, the Employer is at liberty to choose and nominate a Conciliator from the same panel and communicate to the Contractor which will be final and binding on the Contractor.

The Employer and the Contractor shall in good faith co-operate with the Conciliator and, in particular, shall endeavor to comply with requests by the Conciliator to submit written materials, provide

evidence and attend meetings. Each party may, on his own initiative or at the invitation of the Conciliator, submit to the Conciliator suggestions for the settlement of the dispute.

When it appears to the Conciliator that there exist elements of a settlement which may be acceptable to the parties, he shall formulate the terms of a possible settlement and submit them to the parties for their observations. After receiving the observations of the parties, the Conciliator may reformulate the terms of a possible settlement in the light of such observations.

If the Parties reach agreement on a settlement of the dispute, they may draw up and sign a written settlement agreement. If requested by the parties, the Conciliator may draw up, or assist the parties in drawing up, the settlement agreement.

When the parties sign the settlement agreement, it shall be final and binding on the parties and persons claiming under them respectively.

The Conciliator shall authenticate the settlement agreement and furnish a copy thereof to each of the parties.

As far as possible, the conciliation proceedings should be completed within 60 days of the receipt of notice by the Conciliator.

The parties shall not initiate, during the conciliation proceedings, any arbitral or judicial proceedings in respect of a dispute that is the subject matter of the conciliation proceedings.

7.8 **Termination of Conciliation Proceedings**

The conciliation proceedings shall be terminated:

a) by the signing of the settlement agreement by the parties on the date of agreement;

or

b) by written declaration of the conciliator, after consultation with the parties, to the effect further efforts at conciliation are no longer justified, on the date of declaration;

or

c) by a written declaration of the parties to the conciliator to the effect that the conciliation proceedings are terminated, on the date of declaration;

or

d) by a written declaration of a party to the other party and the conciliator, if appointed, to the effect that the conciliation proceedings are terminated, on the date of declaration.

Upon termination of the conciliation proceedings, the Conciliator shall fix the costs of the conciliation and give written notice thereof to the Parties. The costs shall be borne equally by the parties unless settlement agreement provides for a different apportionment. All other expenses incurred by a party shall be borne by that party.

7.9 **Arbitration**

If the efforts to resolve all or any of the disputes through conciliation fails, then such disputes or differences, whatsoever arising between the parties, arising out of or touching or relating to construction/ manufacture, measuring operation or

a) Only such dispute(s) or difference(s) in respect of which notice has been made under Clause 7.1 but could not be settled through Conciliation, together with counter claims or set off, given by the Employer, shall be referred to arbitration. Other matter shall not be included in the reference.

b) The Arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by Employer.

c) The dispute so referred to arbitration shall be settled in accordance with the Arbitration & Conciliation Act, 1996 as amended by the Arbitration & Conciliation (Amendment) Act, 2015 and any statutory modification or re-enactment thereof.

7.9.1 Further, it is agreed between the parties as under:

Number of Arbitrators: The arbitral tribunal shall consist of

i) Sole Arbitrator in cases where total value of all claims in question added together does not exceed Rs. 2.00 crores;

ii) Three (3) arbitrators in all other cases.

7.9.2 **Procedure for Appointment Of Arbitrators:**

The arbitrators shall be appointed as per following procedure:

i) In case of Sole Arbitrator: Within 60 days from the day when a written and valid demand for arbitration is received by Employer, the Employer will forward a panel of 03 names to the Contractor. The Contractor shall have to choose one Arbitrator from the panel of three, to be appointed as Sole Arbitrator within 30 days of dispatch of the request by the Employer. In case the Contractor fails to choose one Arbitrator within 30 days of dispatch of the request of the Employer then Employer shall appoint any one Arbitrator from the said panel of 03 Arbitrator, as Sole Arbitrator.

ii) In case of 3 Arbitrators:

a) Within 60 days from the day when a written and valid demand for Arbitration is received by Employer, the Employer will forward a panel of 5 names to the Contractor. The Contractor will then give his consent for any one name out of the said panel, to be appointed as one of the Arbitrators within 30 days of dispatch of the request by the Employer.

b) Employer will decide the second Arbitrator. Employer shall appoint the second Arbitrator, in addition to the Arbitrator for whom consent was given by the Contractor, within the 30 days from the receipt of the communication regarding appointment of first Arbitrator from the Contractor. In case the Contractor fails to give his consent within 30 days of dispatch of the request of the Employer, then Employer shall nominate both the Arbitrators from the said panel.

c) The third Arbitrator shall be chosen by the two Arbitrators so appointed by the parties out of the panel of 05 Arbitrators provided to Contractor or from the larger panel of Arbitrators to be provided to them by Employer at the request of two appointed Arbitrators (if so desired by them) and who shall act as Presiding Arbitrator. In case of failure of two appointed Arbitrators to reach upon consensus within period of thirty days from the date of their appointment, then, upon the request of either or both parties, the Presiding Arbitrator shall be appointed by the Employer, from above Panel.

d) If one or more of the Arbitrators appointed as above refuses to act as Arbitrator, withdraws from his office as Arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as Arbitrator for any reason whatsoever or dies or in the opinion of the

Employer fails to act without undue delay, the Employer shall appoint new Arbitrator/ Arbitrators to act in his/their place except in case of new Presiding Arbitrator who shall be chosen following the same procedure as mentioned in para (ii)(c) above. Such reconstituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous Arbitrator(s).

e) The Employer at the time of offering the panel of Arbitrator(s) to be appointed as Arbitrator shall also supply the information with regard to the qualification of the said Arbitrators nominated in the panel along with their professional experience, phone nos. and addresses to the Contractor.

7.9.3 **Qualification and Experience of Arbitrators (to be appointed as per sub clause 7.9.2 above):**

The Arbitrators to be appointed shall have minimum qualification and experience as under:

Arbitrator shall be;

A Working / Retired Officer (not below E-8 grade in a PSU with which BMRCL has no business relationship) of any discipline of Engineering or Accounts / Finance department, having experience in Contract Management of Construction Contracts; or A Retired Officer (retired not below the SAG level in Railways) of any Engineering Services of Indian Railways or Indian Railway Account Service, having experience in Contract Management of Construction Contracts; or a Retired Officer who should have retired more than 3 years previously from date of appointment as Arbitrator (retired not below E-8 grade in BMRCL or a PSU with which BMRCL has a business relationship) of any Engineering discipline or Accounts / Finance department, having experience in Contract Management of Construction Contracts or retired judge of any High Court or Supreme Court of India or reputed Chartered Accountant & should be a member of ICAI, New Delhi. No person other than the persons appointed as per above procedure and having above qualification and experience shall act as Arbitrator.

7.9.4 No new claim shall be added during proceedings by either party. However, a party may amend or supplement the original claim or defiance thereof during the course of arbitration proceedings subject to acceptance by tribunal having due regard to the delay in making it.

7.9.5 Neither party shall be limited in the proceedings before such arbitrator(s) to the evidence adduced nor did arguments put forth before the Engineer for the purpose of obtaining his decision. No decision given by the Engineer in accordance with the foregoing provisions shall disqualify him from being called as a witness and giving evidence before the arbitrator(s) on any matter, whatsoever relevant to dispute or difference referred to arbitrator/s. Neither party shall be limited in proceedings before such arbitrators to the evidence produced earlier or the arguments previously put forth during settlement through Conciliation proceedings.

7.9.6 It is agreed by both the Parties that in cases where Arbitral Tribunal consists of a Sole Arbitrator their disputes shall be resolved by the fast track procedure specified in sub-section (3) of 29B of the Arbitration and Conciliation (Amendment) Act, 2015 or as amended up to date.

7.9.7 If the contractor/s does/do not prefer his/their specific and final claims in writing, within a period of 90 days of receiving the intimation from the Employer/Engineer that the final bill is ready for signature of

the Contractor(s), he/they will be deemed to have waived his/their claim(s) and the Employer shall be discharged and released of all liabilities under the contract in respect of these claims.

7.9.8 Arbitration proceedings shall be held at Bengaluru, India and the language of the arbitration proceedings and that of all documents and communications between the parties shall be in English.

7.9.9 The Arbitral Tribunal should record day to day proceeding. The proceedings shall normally be conducted on the basis of documents and written statements. All arbitration awards shall be in writing and shall state item wise, the sums awarded or claims rejected and detailed reasons upon which it is based. A model time schedule for conduct of Arbitration proceedings in a period of 180 days/ 365 days will be made available to Arbitral Tribunal for their guidance. Both the parties should endeavor to adhere to time schedule for early finalization of award.

7.9.10 The award of the sole Arbitrator or the award by majority of three Arbitrators as the case may be shall be binding on all parties. Any ruling on award shall be made by a majority of members of Tribunal. In the absence of such a majority, the views of Presiding Arbitrator shall prevail.

7.9.11 A party may apply for correction of any computational errors, any typographical or clerical errors or any other mathematical error of similar nature occurring in the award of a tribunal and interpretation of specific point of award to tribunal within 60 days of the receipt of award.

7.9.12 A party may apply to tribunal within 60 days of receipt of award to make an additional award as to claims presented in the arbitral proceedings but omitted from the arbitral award.

7.10 **Reasoned Award**

The Arbitrator(s) shall always give item-wise and reasoned award(s) irrespective of the value of claim(s) in the dispute in all cases.

7.11 **Interest on Arbitration Award**

Where the arbitral award is for the payment of money, no interest shall be payable on whole or any part of the money for any period, till the date on which the award is made.

7.12 **Cost of Arbitration**

The cost of arbitration shall be borne by the respective Parties. The cost shall, inter-alia, include the fees of the Arbitrator(s) as per rates fixed by the Employer from time to time.

7.13 **Suspension of Work on Account of Arbitration**

The reference to Conciliation / Arbitration shall proceed not withstanding that the Works shall not then be or be alleged to be complete, provided always that the obligations of the Employer, Engineer and the Contractor shall not be altered by reasons of arbitration being conducted during the progress of the Works. Neither party shall be entitled to suspend the work or part of the work to which the dispute relates on account of arbitration and payments to the Contractor shall continue to be made in terms of the Contract.

8 Indemnity bond:

8.1 It will be the responsibility of the Contractor to make/take delivery, unload and store all the Equipment's / Material. The Contractor shall execute an Indemnity Bond as per the proforma enclosed in Annexure D of Section VII in favour of BMRCL against loss, damage and any risks involved for the full value of these materials. This Indemnity Bond shall be furnished by the Contractor before commencement of

BMRCL

the supplies and shall be valid till the scheduled date of Testing & Commissioning and handing over of the work to the Engineer.

8.2 For the Equipment's/Materials to be provided by the owner, the Contractor shall adopt the following procedure to take delivery of Equipment's/materials.

a) The dispatch title documents will be handed over to the Contractor only after obtaining a Test Report in respect of plant, equipment and materials as per prescribed proforma.

b) The Indemnity Bond as per proforma, enclosed as Annexure-D in Section VI shall be executed by the Contractor.

c) BMRCL will also issue a separate authorization letter to the Contractor to enable him to take physical delivery of Materials/Plant/Equipment's (if required).

9 Storage cum erection insurance:

9.1 All the Equipment and Materials being supplied by the Contractor for the Package shall be kept completely insured by the Contractor at his cost from the time of dispatch from their works, up to the completion of erection, Testing and Commissioning at site and taking over of the project by the Owner in accordance with the Contract.

9.2 Further all the Equipment and Materials being supplied by the Owner for the erection as per Technical Specification shall be kept insured by the Contractor against any loss. damage, pilferage, theft, fire etc. from the time of unloading up to the time of taking over by the Owner including handling, transportation, storage, Erection, Testing Commissioning etc. The premium to be paid to the Insurance Company by the Contractor for such Insurance shall be included in the total Tender price.

9.3 It will be the responsibility of the Contractor to lodge, pursue and settle claims with the Insurance Company in case of any loss. Pilferage, theft, or fire and the Owner shall be kept informed about it. The Contractor shall be responsible to replace any such equipment / material during execution of the Contract irrespective of the time or amount of receipt of insurance claim. Any loss in this regard shall be borne by the Contractor

10 Quantity variation

10.1 The quantities indicated in Schedule of prices are only approximate & may increase or decrease during the execution of the Contract. BMRCL reserves the right to increase or decrease the quantities of items under the Contract but without any change in unit prices or other terms & conditions. Such increase or decrease may vary up to **100%** of the Contracted quantity of individual items subject to a maximum of **+ /- 25% (Twenty-Five Percent)** of the original Contract value. However, the prices quoted by the Tenderer and other terms and conditions shall be valid in spite of such variations in quantities.

10.2 For any additional item/s not found in the BOQ, if it is required to be executed for completion of the work under this Contract, the rate shall be as per BESCOM/KPWD Common Schedule of Rates for the year 2023-24 plus or minus or at par Tender premium which BMRCL has accepted. If the item required is not found in any of the Schedule of Rates, then the mutually agreed market rate shall be adopted but no Tender premium would be applicable which includes latest updated GoK SoRs.

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11 Priority of documents

The documents forming the Contract are to be taken as mutually explanatory of one another. If there is an ambiguity or discrepancy in the documents, the Engineer shall issue any necessary clarification or instruction to the Contractor, and the priority of the documents shall be as follows:

(1) Contract Agreement
(2) Letter of Acceptance, notice to proceed with works
(3) Priced Bill of quantities (as accepted by the Employer)
(4) Technical Specifications
(5) Drawings
(6) Special Conditions of Contract
(7) General Conditions of Contract
(8) Erection Conditions of Contract
(9) Contractor's Proposal and
(10) Any other document listed as forming part of the Contract.

12 Stages of Payment

Compensation for items shall include for all costs incurred in procurement/ manufacture, supply, testing, inspection, shipping, hauling, off-loading, storing at site in Bangalore, installation, testing and commissioning including integrated testing and commissioning. Prices so assigned in the BOQ, for supply and installation of items of materials, plant and equipment shall be full compensation for supply and installation of items of materials, plant and equipment in accordance with drawings and specifications, Payment towards supply and installation will be made after receipt of items of materials, plant and equipment to the Contractor's site store in Bangalore and storing them in a place and manner approved by the Engineer and submission of the following documents:

i. Contractor's Detailed Invoice.
ii. Pre-dispatch clearance certificate issued by the owner, prior to dispatch of the Consignment;
iii. Physical Verification Certificate by the site Engineers
iv. Test Certificates
v. The sub vendor's invoice/ delivery challan;
vi. Copy of the Certificate of Transit Insurance; and
vii. Indemnity Bond and Storage Insurance, on the following basis;

a) 60% payment against supply of material, 30% payment against installation and balance 10% price so assigned for testing and commissioning of items of materials, plant and equipment is tested and commissioned successfully including integrated testing and commissioning and submission of all test results, other documentation including as-built drawings, manuals, etc., as described in the specifications, have been approved by the Engineer. 100% payment for labour or civil charges after completion of work.

b) Payment will be made in RA bills as part payments duly certified by BMRCL for receipt of materials in good condition and correct quantity.

c) Original invoice voucher to be verified by BMRCL and copy to be enclosed with RA bills.

d) Security & Safety of material brought to the site will be sole responsibility of contractor till the completion of corresponding work and handing over to BMRCL.

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SECTION – V

FORM OF TENDER

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FORM OF TENDER

(Refer ITT clause 36.6)

Ref No.: Date. dd.mm.yyyy

From:

To:

The Managing Director
BANGALORE METRO RAIL CORPORATION LIMITED,
III Floor, BMTC Complex, K.H. Road,
Shanthinagar,
Bangalore-560 027.

Sir,

1. Having examined and understood the Instructions to Tenderer, General Conditions of the Contract, Special Conditions of Contract, Technical Specifications and any other documents forming part of the Tender document issued under Tender notification no. ..... dated ..... including any addendum /amendments, the receipt of which is hereby duly acknowledged, I/We the undersigned, hereby submit the fully completed Tender proposal, which includes the following.
    a) Qualification cum Technical Package
    b) Financial Package

    for the said work online through Karnataka Public Procurement Portal (e-Procurement portal).
2. I/We hereby agree to execute the Contract in conformity with the Specifications & Conditions of Contract enumerated in the Tender Documents, for the sum stated & quoted in the Tender or such other sums as may be ascertained in accordance with the Financial Proposal attached herewith and submitted through e-Procurement portal.
3. We undertake that, in competing for (and, if the award is made to us, in executing) the above Contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".
4. We hereby confirm that this Tender complies with the Tender validity and Tender Security / EMD required by the Tender documents.
5. I/We undertake, if the Tender is accepted, to execute the Contract Agreement with in the stipulated time of 21 (twenty-one) working days.
6. In case of acceptance of the Tender, I/We also undertake to carry out supply, installation, testing and commissioning of the Works and complete the same and commission within the stipulated time as specified in the Tender documents and further will obtain and furnish Performance Security for the amount/s specified in 'Appendix to Form of Tender' (Section-VI) for the due performance of Contract.
7. I/We note that the prices offered are firm throughout the period of Contract including extended period if any as per the Commercial Terms and Conditions.
8. I/We agree to keep this Tender valid for a period specified in 'Appendix to Form of Tender' (Section-VII) & it shall remain binding upon us & may be accepted at any time before expiration of that period.
9. Since time is the essence of Contract, I/We undertake that all care is taken not to overrun the time specified and agree to pay penalty (one percent of the Original Contract Price / week subject to a

maximum of ten percent) of the value of work which is not completed for the delay beyond the period specified for completion of the work.

10. I/We have enclosed **BG/e-BG for Rs.**_____ide **BG No.**_____**dated**_____ **of** _____Bank drawn in favour of the Managing Director, BMRCL, Bangalore-560 027 payable at a designated Bank in Bangalore being the requisite EMD as per Tender. Karanataka e-Procurement Portal.
11. Until a Contract is prepared & executed this Tender together with written acceptance by BMRCL by notification of Award shall constitute a binding Contract.
12. I/We understand that BMRCL is not bound to accept the lowest or any Tender it may receive.

Dated this ..... day of ....., 2024.

(Signature)

Name in Block Letter

(In the capacity of)

(DESIGNATION)

Duly authorized to sign Tender for and on behalf of (NAME OF FIRM)

Witness:

Address: **Signature**

APPENDIX TO FORM OF TENDER

SALIENT FEATURES OF CONTRACT

No.	Reference Contract Clauses	Description
1.	Amount of Performance Security (GCC - Clause 12)	**10% (Ten percent) of the Contract Price** in which the Contract price is payable. In the event of variations during the execution of the Contract which result in payments to the Contractor over and above the original Contract price, the Performance Security shall be suitably adjusted.
2.	Date for commencement of the Works (ITT - Clause 31)	Date of issue of Letter of Award (LOA).
3.	Time for Completion (GCC clause 27)	The works shall be completed in all respects within **9 months** from the date of commencement including monsoon period.
4.	Penalty for delay in execution of work (GCC-Clause 29)	i. The penalty shall be 1 % of the original Contract price per week of delay or part thereof subject to a maximum of 10% on the portion of work which is not completed for beneficial use ii. Penalties levied for the following: a) Non-fulfillment of program of works within the stipulated period. b) The number of days allowed beyond the stipulated period for completing the work and c) Extra cost that might be incurred by BMRCL for getting the balance work completed through any other agency as it deems fit under the circumstances will be deducted from money due to him by BMRCL for work done under the Contract or otherwise.
5.	Guarantee of Works / Defects Liability Period (GCC-Clause 35)	For a period of **12 months** from the date of issue of the Completion Certificate / Taking Over Certificate, the Contractor shall be liable for the works or any portion thereof found to be defective for causes arising from faulty materials or workmanship or other causes for which in the judgment of BMRCL/BESCOM, the Contractor is responsible.
6.	Period in which all insurances have to be effected (GCC Sub-Clause 37 and SCC Clause 9)	The Contractor shall maintain adequate Insurance Coverage at all time during the period of Contract and the premium to be paid to the Insurance Company by the Contractor for such Insurance shall be included in the total Contract price.
7.	Validity of Tender (ITT Clause 17)	**120 days** from the last date for Tender submission.
8.	Amount and validity of Tender Security / EMD (ITT Clause 16)	• **INR14,96,242/-**(Rupees Fourteen Lakh Ninety-Six Thousand Two Hundred and Forty-Two Only). • 45 days beyond the validity date of the Tender i.e. **165 days from the last date for Tender submission as per e-Procurement Portal**

No.	Reference Contract Clauses	Description
9.	Date & time and place of Tender Submission and Tender opening (ITT clause 13 and ITT clause 20)	• **Date and Time** As per Date and Time specified in Karnataka Public Procurement Portal. • **Place of submission of Original documents** as listed under ITT clause 13.2: The Chief Engineer(U/S) BMRCL, BMTC Complex, III Floor, Shanthinagar, Bangalore 560027. • **Tender proposal to be submitted online in Karnataka Public Procurement Portal.**
10.	Contractor's Name and Address	---------- *(Tenderers to complete)* ----------
11.	Employer's Name and Address	Bangalore Metro Rail Corporation Limited III Floor, BMTC Complex, K.H.Road, Shanthinagar, Bangalore-560 027, Karnataka State, India
12.	Last date up to which clarification on Tender conditions can be sought	As per Date and Time specified in Karnataka Public Procurement Portal.

SECTION - VI

PROFORMA

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Annexure – A

FORM OF AGREEMENT

(as per 33.0 of ITT)

CONTRACT No. BMRCL.....

This **Contract Agreement** (hereinafter called the **"Contract"**) is made at Bangalore on the .....day of ".....*Month & Year*....." by and between:

BANGALORE METRO RAIL CORPORATION LIMITED, a Company incorporated under Companies Act 1956, represented herein by ....., authorized to sign and bind the Company, with its office located at III Floor, BMTC Complex, K.H. Road, Shanthinagar, Bengaluru 560 027, Karnataka State, India hereinafter referred to as the **"BMRCL"** or the **"EMPLOYER"**, as the case may be, which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and assigns, of the one part,

and

M/s. ".....(*Name of Contractor*) ....." a proprietorship concern having their office/principal place of business at ".....*Address*....." represented by its ..... herein referred to as the **"CONTRACTOR"** which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors to business, legal heir and assigns, on the other part,

WHEREAS the Contractor has offered a Tender for the work of "..... *(name of works)* ....." and for this purpose agrees to undertake performance of the work under the Terms and Conditions set forth in this Contract.

AND WHEREAS BMRCL has accepted the Tender submitted by the Contractor for execution of the aforesaid Work and agrees to hire the 'Contractor' and the 'Contractor' agrees to be hired to implement the work of "..... *(name of works)* ....." vide CONTRACT No. BMRCL..... under the Terms and conditions specified in this Contract Agreement and the other Contract Documents.

Now THEREFORE the parties hereby agree as follows:

Clause 1: Words and Expression

In this Contract, all the words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

Clause 2: The Contract Documents

The following shall be deemed to form and be read and construed as a part of this Contract Agreement:

a) Letter of Award No. ..... dated.....
b) Instructions to Tenderers / Bidders
c) General Conditions of Contract.
d) Erection Conditions of Contract.
e) Special Conditions of Contract.
f) Bid Forms / Tender Forms.
g) Technical Specifications including scope of Work.
h) Priced Bill of quantities.
i) Contractor's Technical and Financial proposal date.....

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Contractor

j) Drawings.
k) All correspondence between the Tenderer / Bidder and BMRCL from the date of issue of NIT and the date of issue of LOA.
l) Performance Security in the form of Bank Guarantee issued by Bank.....(Write name of the Bank) vide B.G. No..... dated..... amounting to Rs..... (in words) ..... valid up to ..... and its authenticity as confirmed by the issuing bank vide their SFMS No.....dated.....
m) Any other document forming part of this Contract.

All of the foregoing documents, together with this Contract Agreement, are referred to herein as the Contract. Also incorporated into the Contract and made part hereof, are all codes, standard specifications, and similar requirements that are referred to therein.

Clause 3: Obligations of the Contractor

The Contractor agrees, subject to the terms and conditions of the Contract, to perform efficiently and faithfully all of the works of ".....*Name of the work*....." which includes ".....*brief description of work*....." required for or incidental to the successful completion of the Works and in carrying out all duties and obligations imposed by, the Contract.

Clause 4: Obligation of the Employer

In consideration thereof, the 'Employer' agrees, subject to the terms and conditions of the Contract, to pay the Contractor the amount specified and at the rates and terms and in the manner set forth in the Contract.

Clause 5: Contract Price and Completion Time:

The Contract price shall be inclusive of all taxes, duties, levies and cess including taxes deducted at source, insurance and exclusive of CGST and SGST. BMRCL shall pay the CGST and SGST as applicable as per law as per clause.26..... of General Conditions of Contract and completion time for executing the works under the Contract are as specified below:

1.	Amount Specified in the Tender	
2.	Accepted percentage premium of the Tender (Above / Below / At par)	
3.	Accepted Contract Price	
4.	Date of Commencement of work	
5.	Completion period	

Clause 6: Integration

The 'Employer' and the 'Contractor' agree that this Contract Agreement, together with other Contract Documents referred to in clause 2 above, expresses all of the agreements, understandings, promises and covenants of the parties, and integrates, combines and supersedes all prior and contemporaneous negotiations, understandings and agreements, whether written or oral and no modification or alteration of the Contract Documents shall be valid or binding on either party, unless expressed in writing and executed with the same formality as this Contract Agreement, except as may otherwise be specifically provided in the Contract Documents. This contract agreement shall prevail in case of any inconsistencies contained in the contract documents.

Clause 7: Governing Law

This Contract is construed and enforceable under the applicable laws of the Republic of India.

Clause 8: Jurisdiction

Where recourse to a Court of law is to be made in respect of any matter, the Court at Bangalore shall have the exclusive jurisdiction to try all disputes between Parties, under this contract agreement.

Clause 9: Language

This Contract Agreement and the other Contract Documents are made in the English language.

Clause 10: Guarantee of works / Defects Liability Period (DLP)

For a period of Twelve (12) months from the date of issue of the completion certificate herein above mentioned, the Contractor shall be liable for the works or any portion thereof found to be defective for causes arising from faulty materials or workmanship or other causes for which in the judgment of BMRCL, the Contractor is responsible.

Clause 11: Notices

All Notices called by the Terms of the Contract shall be in writing in English Language and shall be delivered by hand or by registered Post with acknowledgement due. All notices shall be deemed to be duly made by the party to whom it is addressed at the following address or such other addresses as such party may subsequently notify the other.

To Employer:

Chief Engineer (U/S)

".....Address ....."

To Contractor:

M/s. .....

.....

.....,

IN WITNESS WHEREOF, the parties hereto have caused this Contract to be signed in their respective name by the authorized signatories as of the day and year first above written

BMRCL/The Employer **Bangalore Metro Rail** **Corporation Limited** **(EMPLOYER)**	**.....,** **(CONTRACTOR)**
(.....)	( ) M/s .....,
WITNESS	**WITNESS**
(.....)	( ) M/s .....

Note:-

The Form of Agreement is tentative and may be modified as considered necessary at the time of finalization/signing of the contract.

BMRCL

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Annexure – B

BANK GUARANTEE FOR TENDER SECURITY/EARNEST MONEY DEPOSIT OF TENDER

(Refer ITT clause 16)

(To be stamped in accordance with Stamp Act, if any, applicable for the issuing bank)

To
Bangalore Metro Rail Corporation Limited (BMRCL)
3rd, floor BMTC Complex,
K.H. Road, Shanthinagar
Bangalore- 560027.
Karnataka, India.

1. **WHEREAS** _____ *[Name and Address of the Tenderer]* (hereinafter referred to as the "Bidder" or "Tenderer") has undertaken for submission of Tender in pursuance of Tender Notification No. _____ for _____ *[Name of the Works]* (hereinafter referred to as the "Bid" or "Tender").

2. **AND WHEREAS** it has been stipulated in the Tender issued by Bangalore Metro Rail Corporation Limited (BMRCL) (hereinafter referred to as the "Employer" or "BMRCL") that the Tenderer shall furnish to Employer an unconditional and irrevocable Bank Guarantee from an Indian Scheduled Bank (excluding Cooperative Bank) or from a Scheduled Foreign Bank as defined in Section 2(e) of RBI Act 1934 read with second schedule, for the sum specified herein below as Tender Security(EMD) for compliance of the obligations in accordance with the Tender conditions. In pursuance to this, M/s_____ has requested for issuance of the Bank Guarantee for the sum specified herein below as Tender security (EMD).

3. **AND WHEREAS** we _____ *[Name and full address of the Bank including Email address]* having registered office at _____ (hereinafter referred to as the "Bank"), which expression shall unless repugnant to the context or the meaning thereof, include its successors, administrators, executors, assignees, do hereby agree to give the Employer such a Bank Guarantee drawn and payable at Bengaluru _____ branch on behalf of the tenderer.

4. **NOW therefore**, the Bank hereby affirm that it is the guarantor and responsible to 'Employer' and their successors, on behalf of the 'Tenderer' up to a total sum of INR/Foreign Currency/ies _____ *[the amount of Guarantee to be specified in figure and words in the respective currency/ies as specified in the Tender document]*. Further, the Bank hereby unconditionally, irrevocably and without demur undertake to immediately pay, the Employer upon the Employer's first written demand and without cavil, or arguments any sum or sums within the limits of the sum specified in this Bank Guarantee as aforesaid without the Employer being required to prove or to show grounds or reasons for the demand, by depositing/crediting to the Current Account of the Employer, the sums specified herein.

5. This Bank Guarantee is encashable at the issuing Bank's designated Branch in Bengaluru (Bangalore) Karnataka, India, as mentioned below:
   Name of the Bank, Branch and contact details Address Telephone no: & Fax No: E-mail Address Branch Manager/s name & mobile No: Bank Zonal Office Address, Telephone No, Fax Number, E-mail Address: _____

   OR

   This e- Bank Guarantee shall be encashable at the issuing branch of the Bank through NeSL portal.

6. The Bank hereby confirms that the Bank is on the SFMS (Structural Finance Messaging System) platform and shall invariably send an advice of the Bank Guarantee to the designated Bank of the Employer as given below:

Sl. No.	Particulars	Details
i	Name of Beneficiary	Bangalore Metro Rail Corporation Limited
ii	Name of Bank	Bank of India

BMRCL BANGALORE

iii	Branch	Cantonment Branch, Bengaluru.
iv	Address of Branch	49, Jyothi Mahal, St. Mark's Road, Bangalore - 560001
v	Account No.	840420110000760
vi	IFSC Code:	BKID0008404

7. This Bank Guarantee shall be encashed at the demand of the Employer on or before the due date.

8. The Employer shall have full rights to encash this bank guarantee at any time during the validity period and the 'Tenderer' shall have no right or claim whatsoever in the matter of encashment of the Bank guarantee amount by the 'Employer'. The Bank will be fully responsible in terms of the guarantee and obligation, to make immediate payment to 'Employer', without the consent of the Tenderer and without referring the matter to the 'Tenderer'.

9. The Bank will deliver the money required by the 'Employer' immediately on demand without delay without reference to the 'Tenderer' and without the necessity of a previous notice or of judicial or administrative procedures and without it being necessary to prove to the Bank the liability or damages resulting from any defects or shortcomings or debts of the 'Tenderer'.

10. Courts at Bengaluru, Karnataka, India shall have exclusive jurisdiction for adjudicating the disputes arising out of the encashment of the Guarantee, and, the said Bank undertakes not to revoke this Guarantee during its currency, except with the previous consent of the 'Employer' in writing and agree that any change in the constitution of the Bank shall not discharge its liability hereunder.

11. This Bank Guarantee will not be discharged due to the change in the constitution of the 'Tenderer' or change in the constitution of the bank.

12. This Deed of guarantee is signed and executed by Shri/Smt _____ and Shri/Smt _____ who is/are authorized by the Bank for issuing the guarantee on its behalf and their ID No/s. and Email address/es being_____ & _____ and _____ & _____ respectively.

13. The Bank's liability under this Guarantee shall not exceed the amount of _____ *[Indian Rupees/Foreign Currency/ies to be specified in words and figures].*

14. This guarantee shall be valid till _____ *[Date to be mentioned].*

15. The pendency of any dispute or arbitration or other proceedings shall not affect this guarantee in any manner.

16. It is hereby agreed that the liability of the Bank under this guarantee shall cease on whichever of the following events first occurs.
    a) Payment by the Bank of the guaranteed sum in full to the 'Employer',
    or
    b) Receipt of written communication from the 'Employer' to the Bank along with the original Bank Guarantee discharging the Bank of its liability covered by this Bank Guarantee and in case of electronic Bank Guarantee (e-BG), after release/discharge of e-BG by the Employer through NeSL Portal

SIGNATURE AND SEAL OF THE GUARANTOR
NAME OF THE BANK_____
ADDRESS_____
DATE:

SIGNATURE AND SEAL OF THE GUARANTOR
NAME OF THE BANK_____
ADDRESS_____
DATE:

Notes:

1. *The stamp paper of appropriate value shall be purchased in the name of the bank, who issues the 'Bank Guarantee".*
2. *The above format shall be used for e-Bank Guarantee also.*
3. *For issuance of e-BG, the UIN (PAN No.) of BMRCL is AAACB4881D.*
4. *Tender No. shall be the reference to be mentioned in the e-BG*

BMRCL

Annexure - C

BANK GUARANTEE FOR PERFORMANCE OF CONTRACT

(Refer GCC clause 12)
(To be stamped in accordance with the Stamp Act of the Country of issuing bank)

To
BANGALORE METRO RAIL CORPORATION LIMITED (BMRCL)
III FLOOR BMTC COMPLEX,
K.H. ROAD, SHANTHINAGAR
BANGALORE- 560027.
KARNATAKA, INDIA.

1. **WHEREAS**_____[*Name and Address of the Contractor*] (hereinafter referred to as the "Contractor") has undertaken for due performance of Contract, in pursuance of LOA/Contract No._____ for _____(description of the Contract work of Bangalore Metro Rail Project to be specified) (hereinafter referred to as the "Contract"). The Contract was awarded by Bangalore Metro Rail Corporation Limited (hereinafter referred to as the "Employer" or "BMRCL"), which expression shall unless repugnant to the context or the meaning thereof, include its successors, administrators, executors and assignees, to the contractor.

2. **AND WHEREAS** it has been stipulated in the Contract that the contractor shall furnish to the Employer with an unconditional and irrevocable Bank Guarantee for Performance Security for the sum specified herein below as security for compliance of the obligations and performance of the Contract. In pursuance of this M/s. _____ (the contractor) has requested for issuance of the Bank Guarantee for the sum specified herein below.

3. **AND WHEREAS** we_____ (*the name and full address of the Bank including Email address*) having registered office at_____ (hereinafter referred to as the "Bank") which expression shall unless repugnant to the context or the meaning thereof, include its successors, administrators, executors, assignees and the correspondent Bank hereby agrees to give the Employer on behalf of the Contractor such a Bank Guarantee, drawn and payable at Bengaluru branch.

4. **NOW therefore**, the bank hereby affirm that we are the guarantor and responsible to Employer and their successors, on behalf of the Contractor upto a total sum of _____ (*amount of Guarantee to be specified in figure and words in respective of currency/ies in which the contract price is payable*). Further, the Bank hereby unconditionally, irrevocably and without demur undertake to immediately pay the Employer upon your Employer's first written demand and without cavil, or arguments any sum or sums within the limits of the sum specified in this Bank Guarantee as aforesaid without the Employer being required to prove or to show grounds or reasons for your demand, by depositing/crediting to the Current A/c. of EMPLOYER (BMRCL), the sums specified herein.

5. This Bank Guarantee is encashable at the issuing Bank's designated Branch in Bengaluru (Bangalore) Karnataka, India, as mentioned below:

   Name of the Bank, Branch and contact details, Address, telephone no: & Fax No: E-mail Address Branch Manager/s name & Mobile No: Bank Zonal Office Address, Telephone No, Fax Number, E-mail Address: _____

   OR

   This e-Bank Guarantee shall be encashable at the issuing branch of the Bank through NeSL portal.

6. The Bank hereby confirms that the Bank is on the SFMS (Structural Finance Messaging System) platform and shall invariably send an advice of the Bank Guarantee to the designated Bank of the Employer (Bangalore Metro Rail Corporation Limited) as given below:

BMRCL

Contractor

Sl. No.	Particulars	Details
i	Name of Beneficiary	Bangalore Metro Rail Corporation Limited
ii	Name of Bank	Bank of India
iii	Branch	Cantonment Branch, Bengaluru.
iv	Address of Branch	49, Jyothi Mahal, St. Mark's Road, Bangalore – 560 001
v	Account No.	840420110000760
vi	IFSC Code:	BKID0008404

7. This Bank Guarantee shall be encashed at the demand of the Employer on or before the due date.

8. The Employer shall have rights to encash this Bank Guarantee at any time during the validity period and the 'Contractor' shall have no right or claim whatsoever in the matter of encashment of the Bank Guarantee amount by the 'Employer'. The Bank will have their responsibility in terms of the guarantee and obligation, to make immediate payment to the 'Employer', without the consent of the 'Contractor' and without referring the matter to the 'Contractor'.

9. The Bank shall be liable to pay the 'Employer', any amount up to and inclusive of the aforementioned full amount upon written order from the 'Employer' to indemnify the 'Employer' for any liability or damage resulting from any defects and/or shortcomings of the 'Contractor' and/or the debts the 'Contractor' may have incurred with the 'Employer' and/or any parties involved in the Works under the Contract mentioned above, whether these defects and/or shortcomings and/or debts are actual and/or estimated and/or expected. The Bank will deliver the money required by the 'Employer' immediately on demand without delay without reference to the 'Contractor' and without the necessity of a previous notice or of judicial or administrative procedures and without it being necessary to prove to the Bank the liability or damages resulting from any defects or shortcomings or debts of the 'Contractor'.

10. Courts at Bengaluru, Karnataka, India shall have exclusive jurisdiction for adjudicating the disputes arising out of the encashment of the Guarantee, and, the said Bank undertakes not to revoke this Guarantee during its currency, except with the previous consent of the 'Employer' in writing and agree that any change in the constitution of the Bank shall not discharge its liability hereunder.

11. This Bank Guarantee will not be discharged due to the change in the constitution of the 'Contractor' or change in the constitution of the Bank.

12. This Deed of guarantee is signed and executed by Shri/Smt _____and Shri/Smt _____who is/are authorized by the Bank for issuing the guarantee on its behalf and their ID No/s. and Email address/es being _____ & _____ and _____ & _____ respectively.

13. The Bank's liability under this Guarantee shall not exceed the amount of_____ *[Indian Rupees/Foreign Currency/ies to be specified in words and figures].*

14. This Bank guarantee shall be valid till _____ *[Date to be mentioned].*

15. The pendency of any dispute or arbitration or other proceedings shall not affect this guarantee in any manner.

16. It is hereby agreed that the liability of the Bank under this guarantee shall cease on the happening of any of the following events:

a) Payment by the Bank of the Guaranteed sum in full to the 'Employer',

or

b) Issue of written communication by the Employer, to the Bank, along with the original Bank Guarantee discharging the Bank of its liability covered by this Bank Guarantee and in case of electronic Bank Guarantee (e-BG), after release/discharge of e-BG by the Employer through NeSL Portal.

SIGNATURE AND SEAL OF THE GUARANTOR
DATE: _____
NAME OF THE BANK: _____
ADDRESS: _____

BMRCL

Notes:

1. *Any one of the following type of 'Bank Guarantee' is to be inserted in the heading after the word **'FORM OF BANK GUARANTEE FOR'** according to the purpose:*
   a) *"**PERFORMANCE SECURITY**" or*
   b) *"**MOBILIZATION ADVANCE PAYMENT**" or*
   c) *"**PAYMENT OF RETENTION MONEY**" or*
   d) *"**SAFE CUSTODY OF MATERIALS**".*

2. *In Para-2, insert from the bracket the appropriate option according to the type[2.1] and purpose[2.2] of the BG to fill in the blanks.*
3. *The stamp paper of appropriate value shall be purchased in the name of the bank, who issues the 'Bank Guarantee".*
4. *The Bank Guarantee to be submitted shall be got issued from an Indian Scheduled Bank (excluding Cooperative Bank) or from a Scheduled Foreign Bank as defined in Section 2(e) of RBI Act 1934 read with second schedule.*
5. *The above format shall be used for e-Bank Guarantee also.*
6. *For issuance of e-BG, the UIN (PAN No.) of BMRCL is AAACB4881D.*
7. *Tender No. shall be the reference to be mentioned in the e-BG.*

BMRCL BANGALORE

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Annexure – D

INDEMNITY BOND

[Refer SCC clause 8.2(b)]

THIS AGREEMENT is made on .....by and between BANGALORE METRO RAIL CORPORATION LIMITED, a company registered under the companies Act, 1956 and having its registered office at IIIrd Floor, BMTC COMPLEX, K.H ROAD, SHANTHINAGAR, BANGALORE-560 027 herein after referred to as the "OWNER" (which expression shall, unless excluded by or repugnant to the context or the meaning thereof, be deemed to include its successors and assigns) on the ONE PART

AND

M/s. ..... having its registered office/principal place of business at ..... (Hereinafter referred to as the "CONTRACTOR"), which expression shall unless excluded by or repugnant to the context or the meaning thereof, be deemed to include its successors and assigns on the OTHER PART.

WITNESSETH THAT

WHEREAS, the Contractor submitted Tender for execution of the work of .... In accordance with the finally accepted Tender documents with necessary additions/alterations if any

AND

WHEREAS the Employer has accepted the said Tender submitted by the Contractor wherein the Contractor has agreed to execute the aforesaid work

AND

WHEREAS the Contractor has agreed to execute the work on the terms and conditions stated in the Contract Agreement executed on ..... Clause 25.0 of General Condition of Contact of the said Contract Agreement provides for payment by Employer to the Contractor for execution of the work subject to submission of Indemnity Bond & Insurance.

Now, therefore, in consideration of the foregoing promises and mutual convenience herein contained, the Contractor hereby agrees as follows:

1. The materials brought to the site for executing the Contract, for which payment is made by the Employer to the Contractor shall stand hypothecated to the Employer without any further act.
2. The Contractor do hereby agree that it shall not hypothecate, alienate or create any encumbrance on the materials for which payment is released by the Employer.
3. The Contractor shall confirm and furnish a certificate that materials have been physically brought to and have not been incorporated in the work.
4. It shall be the responsibility of the Contractor to ensure that the materials are stored satisfactorily and are designated in stock. The Employer reserves the right to carry out physical verification by giving notice to the Contractor and the Contractor is bound to give all necessary details including records and invoices for carrying out verification. In the event of any discrepancy noticed by the

BMRCL

Employer, the Contractor do hereby undertakes to make good the losses within ..... days or as notified by the Employer.

5. The Contractor shall ensure that the quantities of stores tally with the quantities of the Contract items for which payment is released by the Employer.
6. The Contractor shall affirm that no materials advance has been paid earlier against the same materials.
7. The Contractor shall ensure that materials conform to the specifications and are of tested quality.
8. The Contractor shall not be entitled to draw / avail loan against the materials for which payment is released by the employer from Bank.
9. The Contractor shall also take Insurance Cover equivalent to the value of the materials for which payment is released by the employer.
10. The Contractor shall provide access to check / cross check the quality / quantity of materials prior to and after the payment.
11. The courts of Bangalore only shall have jurisdiction to deal with and decide any legal matter or dispute whatsoever arising out of this agreement.
12. All the parts of this Contract have been read and fully understood by us.

In witness whereof, the said Company and the Contractor have hereto set their respective hands, on the day, month and year first above written in the presence of the following witnesses:

Name of the Contractor :
Designation of authorized signatory :

Seal of the Contractor :

Witness:

1.....

2.....

BMRCL

Annexure - E

TENDERER'S DECLARATION

I/We have inspected the site of works and have made this declaration that I am / we are fully acquainted with the local conditions in and around the site of works. I/We hereby declare that I/We have gone through the conditions laid down in the information for Tender. Conditions of Contract, Tender specifications, etc and understood the same and on the basis of the same, I/We quoted our rates in the schedule of Quantities attached with the Tender documents.

I/We shall also uniformly maintain such progress as may be directed by the Employer /Engineer to ensure completion of the same within target date as mentioned in the Tender document.

I/We declare that the submission of this Tender is being made by us and confirm that no agent, middleman or any intermediary has been, or will be engaged to provide any services, or any other item of work related to the award and performance of this Contract. We further confirm and declare that no agency commission or any payment which may be construed as an agency commission has been, or will be, paid and that the Tender price does not include any such amount.

I/We undertake to keep the process of Tender evaluation, price and other details confidential.

I/We also undertake to comply with various statutory Laws, Tax Laws, Environmental Laws and Safety measures in execution of the work.

I/We declare that if our Tender is accepted we understand that we are to be held solely responsible for the due performance of the Contract.

I we declare that we will treat as confidential all matters arising in connection with the Tender.

Signature of the Tenderer

Witness:

Address:

Seal of the Tenderer

BMRCL

Annexure - F

UNDERTAKING BY THE TENDERER

(as per 2.6 & 18.1 of ITT)

An undertaking to the effect to be given by the Tenderer

1. We undertake that M/s _____ _____a reputed and certified Electrical Contractor with "_____ License" for doing the "Tendered Work" NOT been Black listed /Debarred by KPTCL / BESCOM or erstwhile KEB /BBMP / any Government / Government undertaking / semi Government / PSU / Govt. Controlled Institutions/projects/ Reputed private organizations in India or Abroad.
2. We also undertake that the Tender submittals does not contain any deviation, amendment, modification or change of any type whatsoever with regard to tender conditions and specifications.

Place: Signature

Date: Name and Designation

Seal of the Tenderer

BMRCL

Annexure - G

WORK EXPERIENCE

Work completed of similar nature during the last five (5) years specified in ITT clause 2.3:

Sl. No.	Project Name	Name of Employer	Description of Work	Contract Number	Value of contract (INR)	Date of issue of Work order	Stipulated date of completion	Actual date of completion	Actual value of work done (INR)
1.									
2.									
...									

If any delay in completion of the work, the reasons for delay shall be explained for such work(s):
.....
.....

Place:

Date:

Signature

Name and Designation

Seal of the Tenderer

BMRCL

Annexure – H

FINANCIAL ELIGIBILITY INFORMATION

1.1 The information to be filled in by the Tenderer hereunder will be used for purpose of computing **Tender capacity** as provided for in Clause 2.4 & 2.5 of the Instructions to Tenderers.

	Description	Financial Year	Total Value of works carried out during the year (In INR)	Multiplication factor for work performed to 2024-25 level	Total value of Works updated to 2024-25
1.2	Total value of works (*) executed and payments received year wise in the last five years (in Rs. Lakhs) #	**2019 - 20**		1.61	
		2020 - 21		1.46	
		2021 - 22		1.33	
		2022 - 23		1.21	
		2023 - 24		1.10	

** ---Value of similar work as defined in ITT Clause 2*
 # --- Attach Certificate from practicing Chartered Accountant.

1.3 Information on works which are yet to be completed and works for which Tenders have been submitted as on date of this Tender.

(A) Existing commitments and on-going works:

Description of Work	Place & State	Contract No. & Date	Name and Address of Employer	Value of Contract (Rs. Lakh)	Stipulated period of completion	Value of works[1] remaining to be completed (Rs. Lakh)	Anticipated date of completion
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

[1]- Attach Certificates duly attested by the Employer or Engineers-in-Charge, of the on-going works.

B) Works for which Tenders already submitted:

Description of Work	Place & State	Name and Address of Employer	Estimated value of works (Rs. Lakh)	Stipulated period of completion	Date when decision is expected	Remarks if any
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Place: Signature

Date: Name and Designation

Seal of the Tenderer

BMRCL

Annexure – I

Contractor's Equipment/Machinery Details

Details of Equipment/Machinery considered essential and to be deployed by the Contractor for successfully carrying out the works:

Sl. No.	Item of Equipment	Requirement[1]		Owned and available			Remarks
		No.	Capacity	Number/ Capacity	Age/ Condition	Ordered or Hired	

Place:

Date:

Signature

Name and Designation

Seal of the Tenderer

BMRCL

Contractor

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PART-B

TECHNICAL SPECIFICATIONS OF BESCOM ADOPTED BY BMRCL FOR:

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PART-B

TECHNICAL SPECIFICATIONS OF BESCOM ADOPTED BY BMRCL FOR:

1. ANNEXURE-1 - Compact Ring Main Unit 103

2. ANNEXURE-2 - 11 KV Class XLPE HT Cables.....113

3. ANNEXURE-3 - Heat Shrinkable Cable Joint kits for cable terminations and joints 125

4. ANNEXURE-4 - LT Feeder Pillar Box 127

5. ANNEXURE-5 - 1.1K V Class LT U G Cables.....133

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ANNEXURE- 1

TECHNICAL SPECIFICATION FOR 11 KV COMPACT RING MAIN UNITS FOR OUT DOOR USE IN 11 KV UNDERGROUND CABLE SYSTEM

1.0 SCOPE:

1.1 This specification covers the design, manufacture, testing and delivery at site for erection and commissioning of "11 KV Outdoor Type Prefabricated Compact Switching Stations", hereinafter called "Compact RMU" to be erected in the underground cable distribution system.

1.2 The Compact RMU shall be suitable for main cable network of 800Amps and loop cable network of 800Amps /630Amps and shall consist of the following:

(a) Two Load Break Switches with Earthling Switches for incoming and outgoing main loop 11 KV XLPE cables of size 240/400 sq.mm cross section aluminum conductor,

(b) One Circuit Breaker with Earthing Switch for connecting Distribution Transformer loop 11 KV XLPE cables of size 95 sq.mm cross section aluminum conductor, and

(c) Provision for adding more number of Circuit Breakers of the type mentioned in item (b) above.

1.3 These shall comply with the following system parameters:

1.	Nominal System Voltage:	11 KV
2.	Highest System Voltage:	12 KV
3.	Rated Voltage:	12 KV
4.	System frequency:	50 Hz
5.	Number of Phases:	Three Phase - Three Wire

1.4 The Load Break Switches with Earthing Switches, and the Circuit Breakers with Earth Switches used in the Compact RMU shall be of Vacuum or SF_6 gas filled type meeting the following criteria:

1.	Lightning Impulse Withstand Voltage (a) Phase - to - Phase & Phase - to - Earth: (b) Across the Isolating distance:	 75 KVp 85 KVp
2.	Power Frequency Withstand Voltage: (1) to earth, between poles and across opening (2) switch device (3) across isolating device	 28 KV RMS for minute 32 KV RMS for 1 minute
3.	Rated Short Time Breaking Capacity	21 KA for 3 sec
4.	Rated duration of Short Circuit:	3 seconds
5.	Rated Normal Current for Circuit Breaker:	200 Amps rms
6.	Load Break Switches : (a) Rated Short Circuit making capacity: 52.5 KA peak at rated voltage (both the earth switches and Load Break Switches) (b) Rated Load Interrupting Current: 800 Amps / 630 A rms	

1.5 The configuration of the Compact RMU shall be generally as per Figure 1 enclosed. Provision should be made to extend the Compact RMU by installing additional Circuit Breakers of similar design.

1.6 All the switchgear shall be capable of withstanding the specified current without any damage being caused, in accordance with the latest versions of IEC 60694 and IS 3427.

1.7 Suitable Meter & CT's along with suitable wiring and other accessories shall be provided as per BESCOM Metering specifications / norms.

2.0 QUALIFYING REQUIREMENT:

2.1 The manufacturer shall have manufactured and tested successfully similar units which have been installed and commissioned and are in commercial operation for a minimum period of three years. The performance reports from the utility at which the same are operating should be furnished.

3.0 SERVICE CONDITIONS:

3.1 The equipment shall be suitable for installation at location having the following climatic conditions:

(a) Annual average ambient temperature : 40°C
(b) Maximum ambient temperature : 45°C
(c) Temperature rise due to solar absorption: 10°C
(d) Maximum relative humidity : 95%
(e) Annual rainfall : 1000 to 1200 mm
(f) Duration of rainy season : May to October
(g) Altitude : up to 1000 M above MSL
(h) Environmental condition : Exposed to sun and rain by the side of road and subject to dust and Pollution from the heavy vehicular Traffic.

4.0 STANDARDS:

4.1 The equipments and all the components shall meet the requirements of the latest versions of the following standards:

(a) IS 3427: AC metal enclosed switchgear and control gear for rated voltages above 1 KV and up to and including 52 KV.
(b) IS 12063: Classification of degrees of protection provided by enclosures of electrical equipment.
(c) IS 9920 (Parts 1 to 4): High Voltage Switches.
(d) IS 9921 (Parts 1 to 5): Specification for AC disconnectors and earthing switches for voltages above 1000 V
(e) IS 13118: HV AC Circuit Breakers.
(f) IS 12729: General requirements of switchgear and control gear for voltages exceeding 1000 V
(g) IS 10601: Dimensions of terminals of HV Switchgear and Control gear.
(h) IEC 1330: High voltage/Low voltage prefabricated substations
(i) IEC 60694: Common clauses for MV switchgear standards.
(j) IEC 6081: Monitoring and control.
(k) IS 2705: Current Transformers
(l) IS 8686: Specification for Static Protective Relays

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4.2 In case of equipments and/or components of the same conforming to any other International standards, which are equal to or higher but not less rigid than the standards and specifications mentioned above, the same should be clearly indicated and a copy of such standards shall be furnished along with the offer. Whenever such standards are in any other language other than English, an English translation of the same shall also be furnished.

5.0 DESIGN:

5.1 The compact RMU shall be designed to operate at the rated voltage of 12 KV. It shall consist of Two numbers of 630 Amps Vacuum or SF_6 Insulated Load Break Switches as Incomers and the required numbers of 200 Amps Vacuum or SF_6 Circuit Breakers suitable for control of 11 KV Transformer loop circuits consisting of several distribution transformers; total load of which do not exceed 3500 KVA. It shall also include, within the same metal or earth screened cast resin enclosure, earthing switches for each Load Break Switch and Circuit Breaker for earthing each of the devices. Suitable fool-proof interlocks shall be provided to these earthing switches to prevent its inadvertent or accidental closing when the circuit is live and the concerned Load Break Switch/Circuit Breaker is in closed position. The limiting dimensions shall be preferably around 1800-mm width x 1100-mm depth x 1900-mm height for the initial two Load Break Switches and one Circuit Breaker. Suitable width for each addition of the Circuit Breaker is allowed. Provision should be made for extension of few more Circuit Breakers or Load Break Switches on a future date. In case of gas filled units, the switchgear and bus bars shall be contained in stainless steel/earth screened cast resin enclosure filled with gas at relative pressure between 0.2 and 0.8 bar to ensure adequate insulation and safe operation. The assembly should not require further gas processing during its expected life of operation of 30 years as per Clause GG 2.3 and 3.3 of IS 3427. The degree of protection required against environment shall be not less than IPX4 of IS 12063. The Compact RMU shall have at least an IP54 Protection Index as per IS 12063 against dust and splashing of water. The active parts of the switchgear shall be maintenance free and the Compact RMU shall be of low-maintenance type.

5.2 The tank shall be made of suitable stainless steel of adequate thickness or earth screened cast iron resin and shall be able to withstand any accidental internal over pressure of at least 3 bars.

5.3 The Compact RMU shall be suitable for mounting on its connecting cable trench. A suitably sized nameplate clearly indicating its functional units and their electrical characteristics shall identify each unit. The positions of the different devices shall be clearly visible to the operator on the front of the compact RMU and the operations shall be clearly visible. The compact RMUs shall be such that access to live parts shall not be possible without the use of tools.

5.4 The design shall incorporate such features to prevent any accidental opening of the earth switch when it is in closed position. Similarly accidental closing of Circuit Breaker or Load Break Switch shall be prevented when the same is in open position from the release of any latch or spring in tension due to vibrations caused externally or internally and shall prevent accidents.

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6.0 EARTHING:

6.1 There shall be continuity between metallic parts of the Compact RMUs and cables so that there is no dangerous electric field in the surrounding air and safety of the personnel is ensured. The frames should be connected to the main earth bars. The cables should be earthed by an Earthling Switch having the specified short circuit making capacity. The Earthling Switch shall be operable only when the main switch is open and suitable mechanical fail-proof interlock shall be provided for the same.

6.2 The Earthling Switch shall be provided with a reliable earthling terminal for connection to an earthling conductor having a clamping screw, suitable for the specified earth fault conditions. The diameter of the clamping screw shall be at least 12 mm. The connection point shall be marked with the earth symbol. The flexible connections between the earthling blade and the frame shall have a cross section of at least 50 square mm copper or equivalent in aluminum.

6.3 The Earthling Switch shall be fitted with its own operating mechanism and manual closing shall be driven by a fast acting mechanism, independent of operator's action. The moving contacts of the Earth Switch shall be visible in the closed position through transparent covers. Mechanical interlocking system shall be such that the operating staff shall be prevented from closing the Earthing Switch when the main switch is closed.

7.0 INCOMER LOAD BREAK SWITCHES:

7.1 The Load Break Switches shall be maintenance free. The position of power contacts and earthing contacts shall be clearly visible on the front of the Compact RMU. The position indicator shall provide positive contact indication in accordance with IS 9920. In addition, the manufacturer shall prove the reliability of indication in accordance with IS 9921. These switches shall have three positions, viz. Open, Closed and Earthed and shall be constructed in such a way that natural interlocking prevents unauthorized operations. The switches shall be fully assembled in the factory. Manual opening and closing shall be driven by a fast-acting mechanism, independent of operator's action.

7.2 Facility for remote operation in future shall be provided with an electrical operating mechanism in a remote location, without any modification of the operating mechanism and without de-energizing the Compact RMU. The switch and earthing switch mechanism shall have a mechanical endurance of at least 5000 operations.

8.0 CIRCUIT BREAKERS:

8.1 The Circuit Breakers shall be maintenance free. The position of power contacts and earthing contacts shall be clearly visible on the front of the Compact RMU. The position indicator shall provide positive contact indication in accordance with IS 9920. In addition, the manufacturer shall

8.2 prove the reliability of indication in accordance with IS 9921. These switches shall have three positions, viz. Open, Closed and Earthed and shall be constructed in such a way that natural interlocking prevents unauthorized operations. They shall be fully assembled, tested and inspected in the factory.

8.3 An operating mechanism can be used to manually close the Circuit Breaker and charge the mechanism in a single movement. It shall be fitted with a local system for manual tripping. There should be no automatic reclosing. The Circuit Breaker shall be capable of closing fully and latching against the rated making current. Mechanical indication of the "OPEN" and "CLOSED" position of the Circuit Breaker shall be provided. The breakers of the same type and rating shall be interchangeable.

8.4 When the Circuit Breaker closing mechanism is of the spring operated type, it should not be possible for the Circuit Breaker to close until the spring is fully charged and the associated charging mechanism is fully ready for closing. Wherever external spring charging handle is required to charge the spring, it should be ensured that the same is not allowed to move during the release of its spring energy. Alternately, it should not be possible to release the spring energy till the charging handle is completely disengaged from the mechanism. A visual mechanical indicating device shall be provided to indicate the status of spring viz., "SRING CHARGED" or "SPRING FREE". It shall be possible to charge the spring when the Circuit Breaker is closed and if the spring is released the Circuit Breaker should not open; nor this operation result in any mechanical damage to the component of the Circuit Breaker or its operating mechanism. Alternatively, fast acting reflex mechanism for Circuit Breakers is also acceptable. However the Circuit Breakers shall be suitable for up gradation to remote operation without any changes.

8.5 The Circuit Breaker shall be provided with a suitable protection system that will operate without any auxiliary power supply under fault conditions. The protection system shall comprise of three numbers of Current Transformers of 10P10-accuracy clause and have a rated burden of 15 VA and an electronic relay. The Current Transformers shall have a separate metering core of accuracy clause 1.0 and burden 3.5 VA for future use. The Current Transformers and Static Relays shall conform to IS 2705 and IS 8686 respectively. The over current protection shall have two separate settings, one low setting with IDMT and the other high setting of definite time type. The earth fault protection shall operate by residual current measurement using the sum of sensory secondary currents. The relay shall be self-powered to operate and trip the Circuit Breaker. The relay shall be provided with a testing port in front of the relay. The range of relay settings from a range of 8 Amperes to 200 Amperes corresponding to the rating of underground cable network shall be available in the protection system.

9.0 CABLE TERMINATION:

9.1 The bushing should be conveniently located for workings with cables specified and allow for the termination of these cables in accordance with the prevailing practice and guidelines of cable manufacturers. The dimensions of the terminals shall be in accordance with IS 10601. A non Ferro-magnetic cable clamp arrangement shall be provided for each cable to be terminated in the Compact RMU. Suitable locking arrangement of the Circuit Breakers, Earthing Switches and Load Break Switches with padlocks in the "Open" or "Closed" position shall be provided.

9.2 A “Cable Alive” indicator lamp in the front of Compact RMU shall be providing for each cable using a capacitance voltage divider.

9.3 It must be possible to test the core or sheath insulation of the cables without de-energizing the remaining section of the Compact RMU without accessing the cable compartment and without disconnecting the cable.

10 SAFETY OF EQUIPMENT:

10.1 In case of SF_6 filled equipment, any accidental overpressure inside the sealed chamber shall be limited by the opening of a pressure-limiting device in the rear part of the enclosure so that the gas will be released away from the operator.

10.2 All manual operations shall be carried out on the front of the Compact RMU. The effort required to be exerted on the lever by the operator shall not exceed 250 N.

11 FRONT PLATE:

11.1 The front plate shall be provided with IP2X degree of protection conforming to IS 12063. The front plate should include a clear mimic diagram indicating the functions. The position indicators shall correctly depict the position of the main contacts and shall be clearly visible to the operator. The lever operating direction shall be clearly indicated.

12 FAULT PASSAGE INDICATORS (Optional):

12.1 The Tenderer should quote for fault locators separately as optional extra, as per the following requirements:

The fault locator shall be an electronic device with its own energy source and connected to the Current Transformers and shall be provided with bright LED's clearly visible in daylight. These shall have the facility for Manual reset, resetting after a time interval and resetting on restoration. They shall be fully programmable and shall have atleast 16 settings for earth fault and four settings for phase to phase faults. It should be possible to test these indicators at site through "Test" push button.

12.2 Rates for this item shall be quoted separately and the purchaser reserves the right to exclude or include the same while placing the order on the successful Tenderer.

13 TESTS:

13.1 Type test reports for all the type tests required to be conducted as per the standards mentioned in these specifications shall be furnished along with the bid.

13.2 Routine tests and acceptance tests shall be conducted in accordance with these standards in presence of the purchaser's representatives. The contractor shall give at least 15 days advance notice for witnessing these tests. Copies of test reports of all these tests shall be furnished to the purchaser for approval. Each completely wired Compact RMU shall be tested to ensure all of its protective; control and interlock systems operate satisfactorily. The Tenderer shall indicate the tests to be carried out in the field after the installation and before commissioning.

14 INSTRUCTION MANUALS:

14.1 Six copies of installation, operation and maintenance manuals shall be supplied along with the equipment. Two additional copies of these manuals shall be supplied at the time of commencement of works before the materials are supplied. These manuals shall be complete in all respects furnishing the constructional and operational features of the equipment. The same shall contain all the details and required drawings and/or illustrations along with the overall

procedures to enable to identify all the parts and consumable spares, which may have to be identified readily for ordering purpose.

15 DRAWINGS:

15.1 The contractor/supplier shall submit complete sets of drawings and diagrams for approval within 15 days of receipt of the order before proceeding with manufacture. After approval of these drawings, a complete set of reproducible of all the drawings shall be submitted along with six copies of each of the drawings.

16 FORMATION OF COMPACT RMU:

16.1 The compact RMU shall be of single bus bar, outdoor type, tropicalized in accordance with the relevant clauses mentioned in these specifications. An earth fault passage indicator using a core balance Current Transformer shall be provided for the Incomers to assist in identifying the faulty cable section in order to isolate the same.

16.2 The Incomer panel shall comprise of, but not limited to the following:

1. A triple pole Vacuum / SF_6 Load Break Switch rated 630 Amps or higher, with a rated making capacity under fault conditions with short circuit levels of 25 KA or above at 11 KV
2. Core balance Current Transformer and earth fault passage indicators (The indicator flag of the relay shall be visible till such time the relay is reset manually) these shall not require any external Power Supply and must be suitable for unattended places.

16.3 The transformer loop circuit control panels shall consist of but not limited to the following:

1. A triple pole Vacuum/SF6 Circuit Breaker rated 200 Amps or higher, with a rated making capacity under fault conditions with short circuit levels of 25 KA or above at 11 KV.
2. Manually charged spring closing mechanism.
3. Electronic relay with associated 15 VA burden Current Transformers of accuracy clause 10P10 and tripping mechanism.
4. Mechanical "ON", "OFF" indicator.
5. Manual tripping device.
6. Mechanical "Spring Charged", "Spring Free" indicator in case of stored energy devices.
7. Provision for retrofitting meters and SCADA System.

17 ACCESSORIES:

17.1 The following accessories shall be provided for each compact RMU:

1. Pad locks for all doors with one set (3 Nos.) Master keys
2. Earth bus formed out of 50X6 mm GI earthing flats
3. Wire guard protective mesh on the front doors and back for prevention of pasting of papers etc.
4. Base channel with foundation bolts
5. Ventilating louvers with weld mesh
6. Live part shrouds, danger plates, caution boards, name plates, rating plates etc. as per requirements
7. Bus bar supports (Porcelain insulator supports) as required
8. All other components, even though not specifically mentioned, but required for the safe operation of the unit.

18 INFORMATION TO BE FURNISHED ALONG WITH THE TENDER:

18.1 The following information shall be furnished along with the bid:

1. Completely filled in the "Guaranteed Technical Particulars" given below
2. Catalogues describing the equipment duly indicating the model
3. Literature describing the operational features
4. Typical GA drawings
5. Type Test Certificates
6. List of utilities where similar equipments are working
7. Details of experience
8. Foundation drawings.

19 GUARANTEED TECHNICAL PARTICULARS FOR 11 KV CIRCUIT BREAKERS AND LOAD BREAK SWITCHES

A) SF6 / Vacuum Circuit Breaker :

a)	Type	
b)	Rated Voltage	
c)	Breaking Current	
d)	Making Current	
e)	Rupturing Capacity	
f)	Rated Current	
g)	No. of Poles	
h)	Operating mechanism	

B) Load Break Switches :

a)	Type	
b)	Duty cycle	
c)	Rated current	
d)	Rated breaking capacity	
e)	Fault making capacity	
f)	Rupturing Capacity	
g)	No. of poles	
h)	Operating mechanism	
i)	SF6 tank	
j)	Interlocks	
k)	Operation safety	

C) Bus bar :

a)	Material	
b)	Type	
c)	Rated Current	
d)	Short time rating for 3 /1 Sec.	

D) Protection:

a)	**Protection :**	

20 GUARANTEED TECHNICAL PARTICULARS FOR RMU

The Tenderer shall furnish the following data for the Load Break Switches and Circuit Breakers used in the Compact RMU:

1. Rated Voltage
2. Rated Insulation Level
3. Rated Frequency
4. Rated Normal Current
5. Rated cable charging breaking current
6. Rated short circuit breaking current
7. Rated transient recovery voltage for terminal faults
8. Rated characteristics for short line faults
9. Rated short circuit making current
10. Rated duration of short circuit
11. Rated opening time, break time and closing time
12. Type test certificates
13. Constructional features
14. Details of operating mechanism
15. Overall dimensions of Compact RMU
16. Limits of gas pressure (in case of SF_6 filled equipment)
17. Clearances between live parts and contacts
18. Total transportation weight
19. Special features if any
20. Foundation loads and details
21. Internal Arc Test for Outdoor applications.

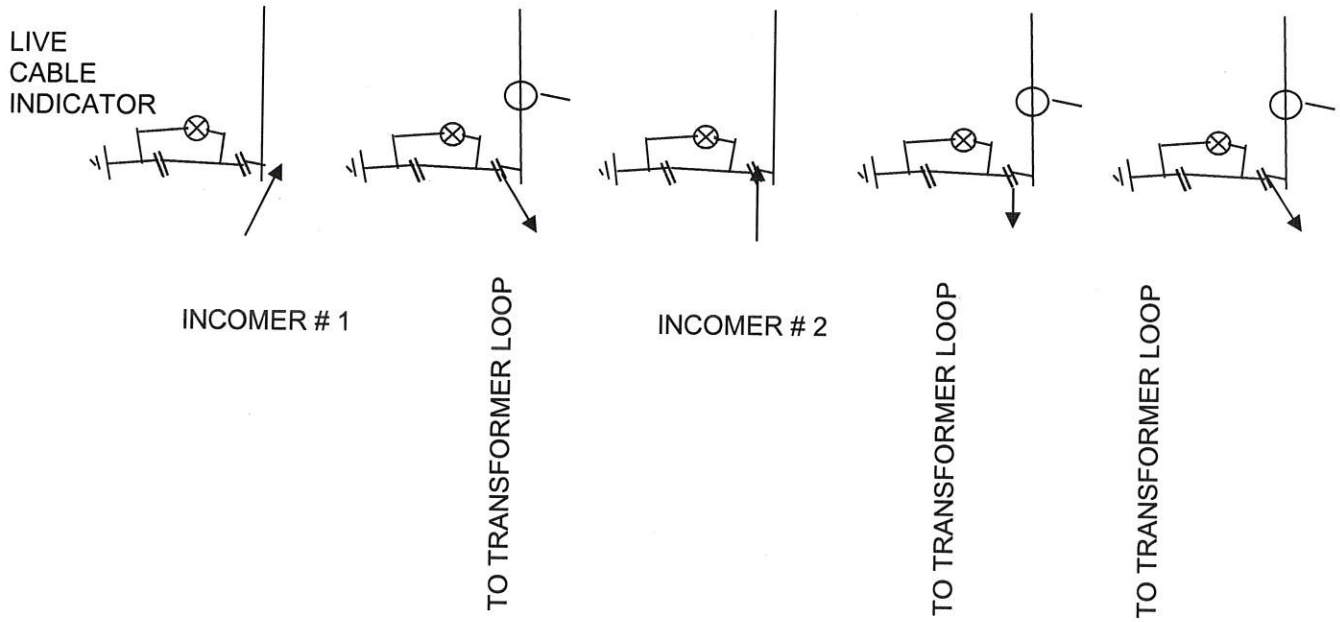

FIG 1 : - SINGLE LINE DIAGRAM OF TYPICAL 11 KV (2 + 3) COMPACT RING MAIN UNIT

ANNEXURE-2

TECHNICAL SPECIFICATIONS FOR CROSS LINKED POLYETHYLENE INSULATED 3 CORE 11KV CABLES

1. **SCOPE:**

1.1 The scope of this package, covers the design, manufacture, stage inspection at works, inspection and testing of finished cables at manufacture's works, testing at independent test house, packing, transport and delivery to consignee's address of 6.35/11KV Three Core, aluminium conductor, XLPE insulated, screened, underground Cables as per specified construction.

1.2 Technical Requirement: Three Core 6.35/11KV grade, 90^0C rating heavy duty power cable with stranded compacted circular aluminium conductor shielded with extruded semi conducting compound, cross linked polyethylene insulated, shielded with extruded semi conducting compound and copper tape, shielded cores laid up with fillers, inner sheath of extruded PVC, Galvanized round steel wire Armour and PVC ST-2 overall sheath.

1.3 The cables should be suitable for use in solidly earthed system.

1.4 The Stranded Aluminium Conductor for different sizes of cable shall have the short circuit rating specified in this document, in schedule of requirement, schedule-I, Annexure TS-1.

2. **STANDARDS:**

3. The 11KV UG Cables shall, in general, meet the requirements of the latest edition of the Bureau of Indian Standards, (generally referred as IS) IS 7098 (Part-2) 1985. The cables manufactured to and meeting the testing requirements of international standards, like B.S.S. IEC or equivalent standards are also acceptable. The bidders shall enclose a copy of the equivalent international standard, in English Language, along with the Bid.

4. The extracts from IS 7098 (Part 2) are given in Annexure TS-3. The cables and components in general shall meet the requirement Indian Standards with latest amendments or equivalent International Standards.

IS: 7098 (Part 2)	1985	:	Specification for cross linked polyethylene insulated PVC sheathed cables
IS: 8130	1984	:	Specification for conductors for insulated Electric Cables
IS: 3975	1979	:	Specification for mild steel wires, strips and tapes for armouring of cables.
IS: 10810 (Part 1 to 55)	1984	:	Specification for test on cables
IS: 5831	1984	:	Specification for PVC insulation and sheath of electric cables
IS: 10418	1982	:	Specification for drums for electric cables
IS: 10462 (Part-I)	1983	:	Fictitious calculation method for determination of dimensions of protective covering of cables: Part-I Elastomeric and thermoplastic insulated cables.

5. 11 KV underground cables shall be manufactured to the highest quality, best workmanship with scientific material management and quality control. The Bidder shall furnish the quality plan, giving in details the quality control procedures/management system.

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6. The successful bidder shall give sufficient advance notice to the purchaser of not less than fifteen days to arrange for stage inspection and inspection of quality assurance programme during manufacture, at the works.

3. **SYSTEMS DETAILS:**

3.1 **General Technical Particulars:**

1.	Nominal System Voltage (rms) (u)	-	11 KV
2.	Highest System Voltage (rms) (um)	-	12 KV
3.	Phase to Earth Voltage (uo)	-	6.35 KV
4.	Number of Phases (for 3 core cables)	-	3
5.	Frequency	-	50 Hz
6.	Variation in frequency	-	±3%
7.	Type of Earthing	-	Solidly Earthed
8.	Basic impulse level (1.2/50 Micro Second Wave	-	75 KV
9.	Total relay & circuit break operating time	-	15-20 Cycles
10.	One minute power frequency withstand voltage	-	28 KV

4. **INSTALLATION CONDITIONS**:

a) Mostly directly buried in ground, partly in RCC/Hume pipes or stoneware pipes at road crossing in case of 3 core cables.

b) If more than one circuit is laid in the same trench, then laid in flat formation for 3 core cables.

c) Metallic coverings are connected solidly to earth at both ends of the run for 3 core cables and.

d) Normal depth of laying is 900 mm to 1000 mm (from top of round to entre of cable).

e) Nature of soil – Heterogeneous, sandy.

f) Soil resistivity: variable 18 to 100 Ohm – meter

g) Soil Thermal resistivity (assumed) 120 to 150 dig. C. Cm/w.

5. **CLIMATIC CONDITIONS**:

5.1 The climatic conditions at Bangalore City where these 11KV Cables will be installed are as under:

1	Location	Karnataka (28.58 N, 77.38E)
2	Altitude	1000 M above MSL
3	Max. ambient air temperature	45^0 C
4	Max. daily average air temp.	38^0 C
5	Minimum ambient air temp.	10^0 C
6	Ground temperature at depth of laying assumed	35^0 C (Max.)
7	Isoceranic level	5^0 C (Min.)
8	Avg. annual rainfall	As per IS:45
9	Avg. number of rainy	1450 Sq.mm.
10	Climate	Tropical Moderately hot and humid
11	Soil	Normally dry. As per IS:1200 Part-I, 1974, likely hood of subsoil water at certain location at depth of burial of cables.

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6. **DESIGN CRITERIA**:

6.1 The cables that are covered in these specifications are intended for use in the Karnataka Power distribution system, under the climatic conditions and installation conditions descried in the technical specification.

6.2 Any technical feature, not specifically mentioned here, but is necessary, for the good performance of the product, shall be incorporated in the design. Such features shall be clearly brought out under Technical deviations schedule only in the offer made by the Bidder, giving technical reasons, and justifying the need to incorporate these features.

6.3 For continuous operation of the cables, at specified drawing, the maximum conductor temperature shall be limited to the permissible value as per the relevant standard, generally not exceeding 90^0C under normal operation and 250^0C under short-circuit conditions.

6.4 The cables in service will be subject to daily load cycles, of two peaks during day, morning peak and evening peak with reduced loading during the nights.

6.5 The materials used for sheaths shall be resistant to oils, acids and alkalies.

6.6 The cables shall be designed to withstand the thermo mechanical forces and electrical stresses during normal operation and transient conditions.

6.7 The Cables shall be designed to have a minimum useful life span of forty years.

6.8 Core identification: The core identification for 3 core cables shall be provided, by suitable means, like, by application of coloured stripes, or by numerals or by printing on the cores as per clause 13 of IS:7093.

7 **MANUFACTURE PROCESS, CROSS LINKING OF INSULATION:**

7.1 Cross linking of the insulation materials (pre compounded polyethylene) shall be conforming to IS:7098 (Part-II).

7.2 The conductor screen shall be of extruded semi conducting compound. The insulation screen shall consist of the nonmetallic part extruded semi conducting compound with non magnetic metallic port. The XLPE insulation and the shields for conductor and insulation shall be extended in one operation.

8 **MATERIALS:**

8.1 CONDUCTOR: The conductor shall be of stranded construction. The material for conductor shall consist of plain aluminium of H2 or H4 grade as per clause-3 of IS:8130/1984.The number of wires in the conductor shall be not less than the appropriate minimum number given in Table-2 of IS:8130/1984.

8.2 INSULATION: The insulation shall be cross linked polyethylene conforming to the requirements given in Table-1 of IS:7098 Part-II.

8.3 SCREENING: The screening shall consist of semi conducting compound. The metallic screen for core shall consist of copper tape. The metallic screen with Armour shall be designed to carry the minimum short circuit rating for 1 second. (The design calculations shall be furnished by the tenderer).

The semi-conducting compound shall withstand the operating temperature of the cable and shall be compatible with the insulting materials.

8.4 **Filler and inner sheath for Multi Core Cables:**

For Multi Core cables, the interstices at the centre shall be filled with a non-hygroscopic materials. The interstices around the laid up cores shall be covered with PVC compound type S.T-2. This will form the inner sheath for Multi Cores Cables.

8.5 **ARMOURING FOR 3 CORE CABLES:**

The armour shall be galvanized round steel wire, complying with the requirements of IS:3975. The Single Core Cables shall be armoured with hard drawing Aluminium round wire. A binder tape may be applied on the armour.

8.6 **OUTER SHEATH**:

The outer sheath shall consist of Poly Vinyl Chloride (PVC) compound, confirming to the requirements of Type ST-2 of IS:5831 suitable additive shall be added to give anti termite protection.

9 **CONSTRUCTION:**

9.1 The general constructional features of the cables shall be as follows:

a) **3 Core Cables**: Stranded, Compacted, Circular, Aluminium Conductor, Conductor Screen of extruded semi conducting compound, Cross linked polyethylene insulation, cross linked, shall be conforming to IS:7098 (Part-II).

b) Insulation screen consisting of non-metallic part of extruded semi conducting compound and the metallic part of copper tape(s).

c) Pressure Extruded PVC inner sheath Armour (Galvanised Steel round wire) Other PVC sheath with anti-termite treatment.

10 **CONDUCTOR:**

10.1 The conductor shall be stranded, compact, circular of aluminium wires of H2 or H4 grade plain aluminium wires.

a) The conductor shall be clean, uniform in size and shape smooth and free from harmful defects.

b) Not more than two joints shall be allowed in any one of the single wire forming every complete length of conductor and no joint shall be within 300 mm of any other joint in the same layer. The joint shall be made by brazing, silver soldering or electric or gas welding.

c) No joints shall be made in the conductor after it has been stranded.

10.2 **CONDUCTOR SCREEN**: The conductor screen shall be provided over the conductor consisting of extruded non metallic semi conducting compound.

10.3 **INSULATION**: The insulation shall be provided over the screened conductor with cross linked polyethylene, applied by extrusion and shall be of high quality, cross linked, shall be conforming to IS:7098 (part-2).

a) **THICKNESS OF INSULATION**: The average thickness of XLPE insulation shall not be less than the nominal value subject to the applicable tolerance as specified in table 2 of IS: 7098.

b) The insulation shall be applied to closely fit on the conductor screen, and it shall be possible to remove it without damaging the conductor.

c) The thickness of semi conducting screen over insulation should not be included in the thickness of Insulation.

10.4 **INSULATION SCREENING:** The Insulation screen shall be applied over the Insulations.

a) The Non-Metallic part of the Insulation screen shall consist of extruded Semi conducting compound.

b) The metallic part of the insulation screen shall consist of non-magnetic material, consisting of copper tape or tapes, and shall be applied over the non-metallic part. The metallic tape(s) shall be designed to carry the rated short circuit current.

10.5 **LAYING UP OF CORES:** For multi-core cables, the cores shall be laid together with a suitable right hand lay. The interstices at the centre shall be filled with a non-hygroscopic material.

10.6 **INNER-SHEATH FOR MULTI CORE CABLES:**

a) The cores shall be laid up with a suitable right hand lay and the interstices should be filled with PVC compound type ST2 conforming to IS:5831 or equivalent standard. The filling up of interstices shall be by pressure extrusion and this circular shape and shall bind the cores also.

b) The minimum thickness of the inner sheath shall conform to Table 3 of IS: 7098 (Part-2), 1985 or equivalent standard.

c) The inner-sheath shall be so applied that it fits closely on the laid up cores and it shall be possible to remove it without damage to the insulation cables.

10.7 **ARMOURING FOR 3 CORE CABLES:**

a) **Application**: The armour consisting of Galvanised steel wire shall be applied over the inner sheath for multi core cables.

b) The armour wires shall be applied as closely as possible.

c) The diameter of the galvanised round steel and hard drawn aluminium wires shall conform to IS: 7098 Part (2).

d) A binder tape may be applied on the armour.

e) The Joints in the armour wires shall be brazed/welded with joint surface and rendered smooth. The joints shall be staggered by at least 300 mm from the nearest joint in any other armour wire in the completed cable.

10.8 **OUTER SHEATH:**

a) The PVC outer sheath with anti termite treatment shall be extruded over the armouring for 3 core cables.

b) The colour of the outer sheath shall be black.

c) The thickness of outer sheath shall be not less than the minimum value specified in column 5 of Table 5 of IS: 7098 (Part-2) 1985.

10.9 **IDENTIFICATION:**

The outer-sheath shall have the following information embossed or indented on it, the manufacturer's name or trade mark, the voltage grade, the year of manufacture and the letters "BESCOM". The identification shall repeat every 300/350 mm along with length of the cable.

11 **INSPECTION**:

11.1 Quality Control: The Bidder shall furnish a complete and detailed quality plan for the manufacturing process of the cable. All raw materials shall conform to relevant applicable standards and tested for compliance to quality and requirement.

11.2 During the manufacturing process, at all stages, inspections shall be made to check the physical and dimensional parameters, for verification to compliance to the standards.

11.3 The Bidder shall arrange, for inspection by the purchaser, during manufacture, if so desired by the purchaser, to verify the quality control process of the Bidder.

12 **TYPE TESTS**:

12.1 Notwithstanding, that type test have been conducted earlier, the successful bidder the each member of consortium shall conduct all type tests as per IS:7098 part (2), 1985 with upto date amendments or equivalent international standard at his cost at either CPRI or any other accredited national laboratory/testing house and materials offered for inspection. Only after approval of the test reports from the purchaser materials shall be offered for inspection.

12.2 All type tests, routine, acceptance test shall be conducted in the presence of the purchaser, representative.

12.3 The successful Bidder shall give 15 days advance notice for inspections, and witnessing of tests by the purchaser or his representative.

12.4 A) The following type tests will be conducted on the cable.

a) Test on conductor
b) Test on armour wires
c) Test for thickness of XLPE insulation and inner and outer sheaths
d) Physical test on XLPE insulation
e) Physical test for outer sheath
f) Partial discharge test
g) Bending test
h) Di-electric power factor test
   (i) As a function of voltage
   (ii) As a function of temperature
i) Insulation resistance (Volume resistivity) test
j) Heating cycle test
k) Impulse withstand test
l) High voltage test
m) Flammability test

B) The following test shall be performed successively on the same test sample of completed cable, not less than 10 M in length between the test accessories.

a) Partial discharge test
b) Dending test followed by partial discharge test
c) Dielectric power factor as a function of voltage
d) Dielectric power factor as a function of temperature
e) Heating Cycle test, followed by dielectric power factor and function of voltage and partial discharge test.
f) Impulse withstand test
g) High voltage test.

12.5 **ACCEPTANCE TEST**:

The sampling plan for acceptance test shall be as per IS:7098 Part (2) 1985, Appendix 'A'.

The following shall constitute the acceptance test.

a) Tensile test for aluminium.
b) Wrapping test for aluminium
c) Conductor resistance test
d) Test for thickness of insulation
e) Test for thickness of inner and outer sheath
f) Hot-set test for insulation
g) Tensile strength and elongation at break test for insulation and outer sheath
h) Partial discharge test (on full drum length)
i) High voltage test
j) Insulation resistance (volume resistivity) test.

12.6 **ROUTINE TEST:**

The following shall constitute routine tests:

a) Conductor resistance test
b) Partial discharge test on full drum length
c) High voltage test

13 **PACKING:**

13.1 The cables, as per specified delivery lengths, shall be securely wound/packed in non-returnable, well seasoned sturdy wooden drums, with strong reinforcements so as to withstand rough handling during transport by Rail, Road etc., The packing should withstand storage conditions in open yards. The cable drums shall conform to IS:10418-1982 or equivalent standard.

The drawing of cable drums with full detail shall be furnished, and got approved before dispatch.

13.2 SEALING OF CABLE ENDS ON DRUMS:

a) The Cable ends shall be sealed properly so that ingress of moisture is completely prevented.

b) The individual core endings shall be sealed effectively with water resistant compound applied over the core and provided with a heat shrinkable cap of sufficient length with adequate cushion space so that the conductor does not puncture the cap in case of movement of the core during unwinding or laying. Before sealing, the semi conducting layer on the cores may be removed for about 2 mm at each end, to facilitate checking the insulation resistance from one end, without removing the sealing cap at the other end.

c) The three cores should have a over all heat shrinkable cap with adequate end clearance, and sufficient cushioning to prevent puncturing of the overall sealing cap due to stretching of the cores. The sealing cap shall have sufficient mechanical strength and shall prevent ingress of moisture into the cable.

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d) **CABLE LENGTHS:** The cables shall be supplied in continuous lengths of 250/500 m in case of 3 core cables with a tolerance of ± 5% of drum length.

e) **QUANTITY TOLERANCE:** ±5% tolerance shall be allowed on the ordered quantity.

14 MARKING:

a) The packed a cable drum shall carry the following information, clearly painted or stenciled.
b) The letters "BESCOM"
c) Reference to Standard and ISI Mark
d) Manufacture's Name or trade mark
e) Type of Cable & Voltage grade
f) Number of cores
g) Nominal cores sectional area of conductor
h) Cable code
i) Length of cable on the drum
j) Direction of rotation
k) Gross weight
l) Country of Manufacture
m) Year of Manufacture
n) Purchase Order No. and Date
o) Address of consignee.

15 Cross sectional drawings of the cables giving dimensional details for each size of cable.

An illustrated literature on the cable giving technical information, on current ratings, cable constants, short circuit ratings, derating factors for

SCHEDULE-I

Annexure: TS-1

Schedule of requirement of 3 core armoured, 1 core armoured, 6.35/11KV (E) aluminium conductor, XLPE UG Cables:

Sl. No.	Cross sectional area of conductor (Sq.mm.)	Minimum current rating (Amps) in ground	Minimum short circuit rating (KA/1 Sec)	Delivery length per drum (± 5%)
1	3 x 95	190	8.9	500 M
2	3 x 240	315	22.5	250 M
3	3 x 400	395	37.6	250 M

The approximate current ratings in column 3 are for the following standard installation conditions.

Sl.No	Details	Temperature
i)	Maximum conductor temperature for continuous operation	90 Deg. C.
ii)	Ambient air temperature	40 Deg. C.
iii)	Ground temperature	30 Deg. C.
iv)	Thermal resistivity of soil	150 Deg. C.
v)	Depth of laying	90 cm
vi)	Maximum conductor temperature at the end of short circuit	250 Deg. C.
vii)	Method of installation	Installed single directly buried in ground

SCHEDULE-II

Annexure: TS-2

For the information of Bidder the important extracts from the Indian Standard IS:7098 (Part 2) 1985; "Specification for cross linked polyethylene insulated PVC sheathed cables are furnished here for their reference and to supply for the XLPE Cables called for in the bid specification

TABLE-1:- PROPERTIES OF XLPE INSULATION

Sl. No.	Property	Requirement
1	Tensile Strength	12.5 N/Sq.mm. Min.
2	Elongation at break	200 percent, Min.
3	**Ageing in air over**: a) Treatment: Temperature Duration b) Tensile Strength Variation c) Elongation Variation	 135 ± 3 Deg. C 7 Days ± 25% Max. ± 25% Max.
4	**Hot Set**: a) Treatment: Temperature Time under load Mechanical stress b) Elongation under load c) Permanent Elongation (Set after cooling)	 200 ± 3 Deg. C 15 minutes 20 N/Sq.mm. 175% Max. 15% Max.
5	**Shrinkage**: a) Treatment: Temperature Duration b) Shrinkage	 130 ± 3 Deg. C 1 Hour 4% Max.
6	**Water absorption (gravimetric)**: a) Treatment: Temperature Duration b) Water absorbed	 85 ± 2 Deg. C 14 Days 1 Mg/Sq.mm. cm. Max.
7	**Volume resistivity**: a) At 27 Deg. C b) At 90 Deg. C	 1×10^{14} ohm-cm. Min. 1×10^{12} ohm-cm. Min.

TABLE-2:- NOMINAL THICKNESS OF INSULATION

Nominal Area of Conductor in Sq.mm.	Nominal thickness of insulation (ti) in mm. 6.35/11KV – 3 Core
95	3.6
240	3.6
400	3.6

1. Thickness of insulation: The average thickness of insulation shall not be less than the nominal value (ti) specified in Table-2.
2. Tolerance on thickness of insulation: The smallest of the measured values of thickness of insulation shall not fall below the nominal value (ti) specified in Table-2 by more than 0.1 mm + 0.1 ti.

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TABLE-3:- THICKNESS OF INNER SHEATH (All dimensions in mm)

Calculated diameter over laid up cores (ref. IS 10462 Part 1, 1983) *		Thickness of inner sheath (Min.)
Over	Upto & including	
(1)	(2)	(3)
-	25	0.3
25	35	0.4
35	45	0.5
45	55	0.6
55	-	0.7

(*) Fictitious calculation method for determination, dimensions of protective coverings of cables: Part-I Electrometric and Thermoplastic Cables.

TABLE-4:- DIMENSIONS OF ARMOUR GALVANIZED STEEL ROUND WIRES AND STRIPS

NOTE: The dimensions of Galvanised steel wires or strips shall be as specified in Table-4.

Calculated diameter for Armour (ref. IS 10462 Part 1, 1983) *		Nominal diameter of Round wire
Over	Upto & including	
1	2	4
a) For all diameter in excess of 13		Nil
-	13	1.40
13	25	1.60
25	40	2.00
40	55	2.50
55	70	3.15
70	-	4.00

Note: (a) and (b) indicate two methods of practice in the application of armouring.

* Fictitious calculation method for determination of dimensions of protective covering of cables: Part-I Electrometric & Thermoplastic Insulated Cables.

TABLE-5:- THICKNESS OF OUTER SHEATH (All dimensions in mm)

Calculated diameter under the outer sheath (ref. IS:10462 Part 1, 1983) *		Minimum thickness of outer sheath for Armoured Cables
Over	Upto & including	
1	2	5
-	15	1.24
15	25	1.40
25	35	1.56
35	40	1.72
40	45	1.88
45	50	2.04
50	55	2.20
55	60	2.36
60	65	2.52
65	70	2.68
70	75	2.84
75	-	3.00

(*) Fictitious calculation method for determination of dimensions of protective covering of cables: Part-I Electrometric & Thermoplastic Insulated Cables.

Note:

Armoured Cables: The thickness of outer sheath shall be not less than the minimum value specified in column 5 of Table-5.

Extracts from IS:7098 (Part 2), 1985, on Tests on Cables:

(i) **Partial Discharge Test:** The Partial discharge magnitude at test voltage equal to 1.5 Uo shall not exceed 20 PC.

(ii) **Bending Test:** The diameter of test cylinder shall be (20D ±5) percent, where D is the overall diameter of the completed cable.

(iii) **Dielectric Power Factor Test:**

a) *Tan 'delta' as a function of voltage:*
The measured value of tan 'delta' at Uo shall not exceed 0.004 and the increment of tan 'delta' between 0.5 Uo and 2 Uo shall not be more than 0.002.

b) *Tan 'delta' as a function of temperature:*
The measured value of tan 'delta' shall not exceed 0.004 at ambient temperature and 0.008 at 90 Deg. C.

(iv) **Heating Cycle (As per IS: 10810 Part 49):**
After their cycle, the sample shall be subjected to dielectric power factor as a function of voltage and partial discharge test.

(v) **Impulse withstand test:**
The impulse voltage level for cables of rated voltage 6.35/11KV is 75 KV. No breakdown of insulation shall occur during the test.

(vi) **High voltage test (As a type test/Acceptance test) for 6.35/11KV rated voltage cables:**
The cable shall withstand without breakdown an A.C. Voltage equal to 3 Uo but not less than 17 KV (rms when applied to the sample between conductor and screen/metallic tape/armour, the voltage shall be gradually increased to the specified value and maintained for a period of 4 hours.

Special Instructions:

a) If an existing cable is damaged and to be provided with one/two numbers of straight through joint/s without any additional cable/with small cable piece up to a length of 10 m, the same shall be completed within 2 days from the date, cable is identified for joining.

b) The contractor shall complete any specific work of cable shifting (less than 50m length) within 15 days from the date of cable is identified and notice to start the work is intimated orally/in writing by Engineer-in-Charge.

c) The contractor shall complete any specific work of cable shifting (more than 50 m length) within 30 days from the date of cable is identified and notice to start the work is intimated orally/in writing by Engineer-in-Charge

ANNEXEURE-3

TECHNICAL SPECIFICATIONS FOR HEAT SHRINKABLE CABLE JOINT KITS FOR CABLE TERMINATIONS AND JOINTS

1.0 GENERAL:

1.1 The term heat shrink refers to extruded or moulded polymeric materials which are cross linked to develop elastic memory and supplied in expanded or deformed size or shape.

2.0 QUALIFYING EXPERIENCE:

2.1 The kits should have satisfactory performance record in India in excess of 5 years supported with proof of customers having had satisfactory use of these kits in excess of 5 years.

2.2 HEAT SHRINKABLE MATERIAL:

The heat shrinkable material component used in the joint shall have been produced in a systematic procedure as follows:

The required materials shall be mixed and extruded into the required shape and then cross-linked by irradiation or any other appropriate chemical process. The components are then warmed and stretched by a predetermined amount and allowed to cool in the extruded shape. The cross-linking shall create a memory and when heated again, the same shall come back to its original shape at which it was cross-linked. Heat shrinkable tubes can be reduced to 30% of its expanded dimension by heating.

The volume resistivity of the sleeves shall be 108 ohm-cm and the dielectric constant of around 15 to 30. The limiting temperature shall not be less than 100°C for longer duration and 250°C for one minute.

3.0 TYPE TEST REPORTS:

The Joints and terminations should have been subjected to all the type tests and type test reports shall be furnished for verification.

4.0 COMPRESSION TYPE TUBULAR TERMINAL ENDS:

The materials used in the terminals shall be Aluminum of grade 19501 conforming to IS 5082 - Specifications for wrought aluminum and aluminum alloys bars, rods, tubes and sections for electrical purposes. The finish inside the barrel shall either be suitably roughened throughout the crimping length of terminal end or provided with suitable grease based compound with abrasive

Action. Edges and corners shall be free from burrs and sharp edges. The terminals shall meet the requirements of IS 8309 - Specification for Compression type tubular terminal ends for aluminum conductors of insulated cables.

5.0 JOINT KITS:

The requirements contained in a typical joint Kit are as follows:

(a) Heat shrinkable or push-on or Tapex or cold shrinkable type clear insulating tubes

(b) Stress control tubing where necessary

(c) Ferrule insulating tubing for joints.

(d) Conductive cable break outs for terminations, non tracking, erosion and weather resistant tubing both outer / inner

(e) Non tracking erosions and weather resistant outdoor sheds in case of terminations

(f) High permitivity mastic wedge

(g) Insulating mastic.

(h) Aluminum crimping lugs of ISI specification.

(i) Tinned copper braids

(j) Wrap around mechanical protection for joints.

(k) Cleaning solvents, abrasive strips.

(l) Plumbing metal.

(m) Binding wire etc. adequate in quantity and dimensions to meet the service and test conditions.

The kit shall contain a leaflet consisting of detailed installation instructions and shall be properly packed with shelf life of over 3 years.

ANNEXEURE-4

TECHNICAL SPECIFICATION FOR LT FEEDER PILLAR BOXES

1.0 SCOPE:

1.1 This Technical Specification covers design, manufacture, assembly, inspection and testing at works and supply of

a) 08 way LT Feeder Pillar Box.

b) 12 way LT Feeder Pillar Box.

Complete with accessories and other miscellaneous equipments specified in this specification.

2.0 STANDARDS:

2.1 The equipment should conform in all respects to the relevant latest editions of the Bureau of Indian Standards or other equivalent National or International Standards.

2.2 If the specifications other than those mentioned below are applicable, the fact should be made clear in the Tender and one copy of such standard specifications in the English language shall be enclosed with the Tender.

2.3 The equipment shall also comply with the latest revision of the Indian Electricity Rules and any other applicable statutory provision, rules and regulations applicable in the location where these are to be installed.

2.4 **THE APPLICABLE STANDARDS ARE LISTED HERE BELOW:**

IS: 5-1994 : Colour of ready mixed paints and enamels.

IS: 6875/1973 : Control switches, push buttons and related

Part I & II : Control switches.

IS: 13607/1992 : Ready mixed paint, Finishing, General purpose, Synthetic.

IS: 13947/1993 : Specification for Low-voltage Switchgear and Control gear.

3.0 CLIMATIC CONDITION:

3.1 The Feeder Pillar Boxes offered shall be suitable for being used in the following weather conditions.

a)	Minimum temperature of air in shade	- 5^0 C
b)	Maximum temperature of air in shade	- 50^0 C
c)	Relative Humidity	- 85% - 100%
d)	Average No. of rainy days per annum	- 60 days
e)	Rain fall	- 750-3000mm
f)	Altitude above means sea level maximum	- 1000 Mtrs.

4.0 PRINCIPAL PARAMETERS:

4.1 The Feeder Pillar Box shall confirm to the specific Technical requirement specified hereunder.

1. Rated Voltage - 400 V ± 10%
2. Rated Frequency - 50 HZ
3. Continuous Current Rating - 400A & 600A
4. Type - Out door
5. Mounting - On concrete foundation.
6. Suitable for - 3 ph 4 wire with Neutral Earthing
7. Maximum system Voltage - 1.1KV

Rated short Circuit Level - 50KA @ 400V

4.2 FEEDER PILLAR BOX DESCRIPTION:

4.2.01 Feeder Pillar Box shall be suitable for the purpose for which they are intended to be used.

4.2.02 Each box shall be complete with accessories such as load break switches, bus bars, fuses, lock & key etc.

4.2.03 Feeder Pillar Box shall have access for sufficient ventilation and head description.

4.2.04 The cable entry and exit shall be from the sides through the extended box at the top on the sides. The design of the box must be such as to facilitate easy removal of the cable during erection and repair by suitable bolting the box cover and sliding the bottom plates. The entry of the cable at the extended box shall be through 100mm PVC pipe and projecting 50mm inside the box through suitable glands. The extended box shall be provided with suitable gland and clamps for fixing the cable rigidly. The feeder pillar box shall be suitable for 1.1kV 240 Sq.mm armored UG cable through 100mm PVC pipe and clearance inside the box must be such as to offer fair working facilities during erection and maintenance.

4.2.05 The box shall be vermin proof and dust proof.

4.2.06 Louvers of suitable size shall be provided in the front for ventilation and wire nets shall be provided on the back of the louvers to prevent the entry of dust and insect.

4.2.07 The box shall have double door (self closing type)fitted with internal type door lock with common key for all the boxes and shall given maximum protection to the interior of the box.

The hinged design shall permit doors being completely removed when necessary.

4.2.08 The Feeder Pillar Box shall be suitable to mount on brick concrete foundation. Necessary provision for foundation bolt in the pillar shall be made for GI foundation bolts of size 12mm. Nuts, Bolts and 2 Nos. of Washers

4.2.09 The box shall be provided with suitable rain shed and all bolt and washers used shall be galvanized mild steel.

4.2.10 A danger board as shown in the sketch shall be provided in the front of the box.

4.3 EARTHING:

The box shall be provided with two Nos. of earthing points internally connected with accessible position on the sides. The earthing point shall be provided by 25mm M8 bolts and nuts and marked with ⏚ symbol.

4.4 NAME PLATE AND CIRCUIT BOARD:

4.4.1 The Feeder Pillar Box shall be provided with transparent label or card of removable type and the following information are to be recorded.

(1) Title
(2) Cable Size
(3) Current Rating of I/C Cable
(4) Current Rating of O/G Cable
(5) Current Rating of Fuse Links.
(6) No. of Outgoing Lines.

4.4.2 The label or card shall be fitted on the side of the door and circuit numbering means shall be indicated by symbol or diagram relating to the fuse ways.

4.4.3 The Circuit plate with following engraved informations has to be rivetted to the inside of the door of the feeder pillar box in an accessible position for easy reading.

Incoming Line from :
Incoming Line to :
Outgoing Line ___ Amps to : (1-12)/(1-8)

5.0 FABRICATION:

5.1 The feeder Pillar-Box shall be in conformity with the typical drawing in all respects.
The feeder pillar-Box shall comprise of the following accessories:-

1) Feeder Pillar box Metal Body.
2) Copper / Aluminum bus bar.
3) Removable links.
4) Load break Switch.
5) Porcelain Re-wirable cut-outs.
6) Links

5.2 FEEDER PILLAR BOX METAL BODY:

Feeder pillar box metal body shall be made out of high grade MS sheet confirming to IS1079, with 3.00mm thick for the body and 2.00mm thick for the doors. The metal body shall be robust and painted complete with 2 coats of red-oxides on both side as primary and LIGHT Grey paint with shade 631 of IS-5 for final finish.

5.3 BUS BARS:

Feeder pillar box shall be provided with insulated sleeved bus bar. The bus bar sizes as follows:

Load Break Switch Rating	8 WAY	12 WAY
630 A	30 X 10 mm (300 Sq mm) Copper	30 X 10 mm (300 Sq mm) Copper
400 A	40 X 6 mm (240 Sq mm) Copper	40 X 6 mm (240 Sq mm) Copper
400 A	40 X 10 mm (400 Sq mm) Aluminium	40 X 10 mm (400 Sq mm) Aluminium

The insulated sleeves shall be of high grade with Red, Yellow and Blue colour for three phases and black for neutral.

The bus bar shall be made out of E.C. Grade Copper/ Aluminium flats. The bus bar shall be suitably supported on an insulating base rigidly fitted to the metal box.

The connection to the neutral bus bar is by means of socket. Necessary holes may be drilled on the bus bar for mounting the bus bar and extension.

5.4 FUSE LINK:

a) The feeder pillar box shall be provided with re-wirable porcelain cut out of reputed make and of the following rating:

Fuse Rating	8 WAY	12 WAY
32 A	4 Nos. Per Phase	-
63 A	3 Nos. Per Phase	10 Nos. Per Phase
100 A	1 No. Per Phase	2 Nos. Per Phase

b) The fuse carrier shall be noninflammable and non- hygroscopic and the same shall have a hard glossy surface and shall conform to IS-2086/1993. The extended portion of the fuse carriers should be provided with galvanized M.S. Bolts and nuts. The design of the box shall be suitable for adding a minimum of 3 cutouts on each side. The fuse cutouts should be with extended terminal as shown in the drawing and be of rewireable type. Adequate contact pressure shall be provided in the cutouts for carrying rated current without overheating. The fuse cutouts shall be connected to the bus bar rigidly with aluminum strips of suitable size.

5.5 LOAD BREAK SWITCH:

a) Load break switch shall be suitable to work on 440 V, 400/630A, four pole 50HZ, heavy duty, front operated type, with replaceable silver plate contacts conforming to IS 4064/1978, superior type arc chambers with necessary insulating barriers and enclosed in a compact insulating

cover. The switch shall be designed break the current of 400/630A and able to withstand breaking stresses with quick and reliable spring loaded operating handle.

b) The location of operating handle shall be so as to facilitate convenient operation. The position of ON & OFF must be clearly indicated. The utilization category of the switch shall be Ac-23.

6.0 TEST & TEST CERTIFICATES AND INSPECTION:

6.1 The following routine tests shall be carried out on the panels at the factory:

a) Checking of overall dimension, thickness of box sheet and paint film.
b) Checking correctness of continuity of circuits.
c) One minute HV withstand test – All equipments on panel and internal wiring shall be tested to withstand a test voltage of 2KV to earth for one minute.
d) Insulation resistance of the complete circuit by circuit with all equipments mounted on the panel using insulation Tester/Megger.
e) Verification of degree of protection as per IS: 13947 (part-I).

6.2 The feeder pillar box shall be subjected to type test and acceptable test accessories with the standard to which it conform.

6.3 All routine and acceptance tests shall be conducted in presence of the owner's representative. No material shall be dispatched unless the owner communicated his written approval to these test certificates.

6.4 Copies of the type and routine test certificates for all the components used in the manufacture of the box from a recognized test house (to prove the conformity of the components to the relevant standards) shall be submitted along with the tender.

••••

The HRC fuse switch based LT Feeder pillar boxes shall generally conform to the sketches enclosed and comply with the following requirements.

2.1 MANUFACTURE/CONSTRUCTION OF ENCLOSURE:

The Pillar box enclosure shall be machine made out of Thermoset plastic under compression and temperature.

The Pillar box enclosure should be modular in structure. Pillar box enclosure should have a uniform depth of 322 mm. The impulse withstand voltage shall be 8KV.The rated short time withstand current shall be 25 kA for 1 sec RMS and peak of 52.5kA for phase bus bar system. The IP rating of Pillar box enclosure should be IP44 as per IEC 60529 degree of protection of enclosed equipment.

The Pillar box enclosure should be fully front access ready. The hinges should be concealed. Pillar Box shall have gang operated Fuse switch Disconnector with HRC fuse links on both incoming and outgoing circuit's with necessary interconnecting Bus Bars.

Bus bar supports should be internally moulded in the enclosure. No additional bus bar supports to be used.

Standard General Arrangement of Incoming fuse switch Disconnector and Outgoing fuse

switch disconnector with HRC fuse link, Neutral and phase bus bars, inside the Box is shown in the General arrangement drawings.

The Thermoset Plastic enclosure as well as the HRC fuse switch shall be of the same manufacturer

2.2 CIRCUIT WAYS AND BUS BAR:

The HRC fuse switch based LT Feeder pillar boxes shall be of 3 phase (R, Y, B) arrangement. The Center to center distance between Bus bar should be 185mm.

2.2.1 BUS BAR ASSEMBLY:

The bus bars shall be made up of electrolytic grade aluminium confirming to grade 63401 WP of IS: 5082. The bus bar assembly should be 50mm x 12mm Aluminium flat which would form the current carrying main bus for the LT Feeder pillar box. Both ends of Aluminium flat should be fixed internally moulded in the enclosure without any additional support. The assembly should be as shown in the sketch.

2.3 INCOMERS:

Rating and Type of switching: The pillar box shall have two incomers of 630A three pole gang operated vertical fuse switch disconnector Lockable with 3 padlocks in ON and OFF positions in safe park position to ensure proper closing/opening of switch. When the switch handle is in park position the fuse switch should not be operable without releasing the park position interlock.

Fuse Holding contact Details: The fuse switch design should be such that large arcs are not produced during switching and the contacts should have sacrificial electrodes to conduct and quench any arc away and reduce contact wear. No additional device like arc-chutes should be used for quenching of arcs. The fuse switch contacts should have four parallel line contact, should be made of 99.9% copper, silver plated with 3.5 to 5µm thickness. Other copper parts should be tin plated with 3.5 to 5 µm thickness. Other than current carrying parts, all other parts should be made of suitable insulating material. The contacts should have in built short circuit interlock to prevent pinch effect.

Rated Short time capacity details: The Fuse switch disconnector should have a Rated conditional short-circuit current of 120KA. The Rated short time withstand current ICW of the Fuse switch disconnector should be 15KA for 1 second.

Utilization category: The utilization category of the Fuse switch disconnector shall be AC23B at a rated operational current Ie of 630A and rated operational voltage Ue of 400V.

Rated Impulse withstand voltage: The rated impulse withstand voltage Uimp of the Fuse switch disconnector shall be 12KV with impulse withstand test voltage of U1.2/50µs with a peak value of 20KV across the open main contacts of equipment suitable for isolation.

Insulating Material Details: The fuse holder should be made of polyamide with reinforced fiber glass. The device base/carrier should be made of fiber glass reinforced duroplastic (thermosetting plastic). Further the fuse holding contacts should be shrouded against any accidental hand touching when the strip top is removed. The fuse holding contacts should be so designed to contact fuse blade at right angle.

Fuselink Rating and Size details: The Fuse switch disconnector shall be capable of taking a maximum of 630 A size 3 HRC fuses or any lower rating of size1 and size2 fuses. The incomer Fuse switch

disconnector shall be provided with 315 A size 2 HRC fuse links.

IP Protection: The fuse switch disconnector shall be switchable without any special switching sequence. The IP rating of the Fuse switch disconnector should be IP30 from front side fitted with clamp and lateral covers at an operational status as per IEC-60529 Degrees of protection of enclosed equipment.

Switch Operation details: Insertion and removal of the HRC fuse should be protected against accidental contact (finger proof protected). Switching on and off with HRC fuse links under load condition should be performed with single hand operation, with low switching force and wear free contacts. The fuse switch disconnector should have windows easily visible for indicating the HRC fuses blown out condition in both middle and top of the fuse. It should be possible to measure the voltage across a fuse holding contact without opening the switch. The switch should be of hinged operation. Parallel switching devices are not accepted.

Cable terminal and connections details: The fuse switch disconnector should be provided with suitable terminals to terminate 240 Sq.mm XLPE Aluminium cable each phase using M12 bolt type connection using crimping bimetallic sockets. The connection between main bus bar and fuse switch should be by bus bar only and not by cables. The switch shall have Center to center busbar mounting distance between phases should be 185mm.

2.3.1 OUTGOING:

Rating and type of switching: The pillar box shall have seven outgoings of 160A three pole gang operated vertical fuse switch disconnector lockable with 2padlocks in ON and OFF positions in safe park position to ensure proper closing/opening of switch. When the switch handle is in park position the fuse switch should not be operable without releasing the park position interlock.

Fuse Holding contact Details: The fuse switch contacts should have two parallel line contact. The fuse switch design should be such that large arcs are not produced during switching. No additional device like arc-chutes should be used for quenching of arcs. Other than current carrying parts, all other parts should be made of suitable insulating material.

Rated Conditional Short circuit Current: The Fuse switch disconnector should have a Rated conditional short-circuit current of 120KA.

Utilization category: The utilization category of the Fuse switch disconnector shall be AC23B at a rated operational current Ie of 160A and rated operational voltage Ue of 400V.

Rated Impulse withstand voltage: The rated impulse withstand voltage Uimp of the Fuse switch disconnector shall be 8KV with impulse withstand test voltage of U1.2/50µs with a peak value of 12KV across the open main contacts of equipment suitable for isolation.

Fuse-link Rating and Size details: The Fuse switch disconnector shall be capable of taking a maximum of 160 A size 00 HRC fuses or lower rating of size 00 and 000 fuses. The outgoing fuse switch disconnector shall be provided with 100A/63A size 000 HRC fuse links.

Fuse rating	Twelve Way
100A, Size 000	6Nos
63A, Size 000	15Nos

IP Protection: The IP rating of the Fuse switch disconnector should be IP20 from front side at on operational status as per IEC60529 Degrees of protection of enclosed equipment.

Insulating Material Details: The fuse holder should be made of polyamide with reinforced fiber glass. The device base/carrier should be made of fibre glass reinforced duroplastic (thermosetting plastic). The viewing windows and dropper cover plates shall be made of polycarbonate. Further the fuse holding contacts should be shrouded against any accidental hand touching when the strip top is removed.

Switch Operation details: Insertion and removal of the HRC fuse should be protected against accidental contact (finger proof protected). Switching on and off with HRC fuse links under load condition should be performed with single hand operation and wear free contacts. The fuse blown indicator should be clearly visible in top and middle of fuse through fuse switch integral polycarbonate transparent windows without need of any additional indicator. The fuse switch should be of hinged operation. Parallel switching devices are not accepted.

Cable terminal and connections details: The fuse switch disconnector should be provided with suitable terminals to terminate either 1No of 10 - 95Sq.mm or 2Nos of 10-25Sq.mm XLPE Aluminium cable each phase using bolt type connection using crimping sockets. The connection between main bus bar and fuse switch should be by bus bar only and not by cables. The switch shall have center to center busbar mounting distance between phases should be 185mm.

The HRC fuse switch as well as the Thermoset Plastic enclosure shall be of the same manufacturer

2.4. FUSE LINKS:

Manufacturer's name, current rating, breaking capacity and type shall be marked on HRC fuse links. The fuse links in the incomers and outgoing fuse switch disconnectors shall be as per IS-13703/IEC-60269. The rated breaking capacity shall be 120 KA.

2.5. NEUTRAL BUS BAR:

The neutral bus bar provided in the pillar boxes shall be of **50 x 12 mm** size aluminium flat of adequate length with 2Nos of 14mm hole and 20Nos of 9mm as per the sketch enclosed. The neutral bus shall be firmly fixed within enclosure.

2.6 MARKING:

The position of the poles (phases) may be indicated by appropriate coloring viz., RED, YELLOW AND BLUE. Incoming and Outgoing circuits may be indicated/marked with appropriate labeling.

2.7 DIMENSIONS:

The sketch enclosed shows the details of HRC fuse switch 12Way thermoset plastic LT Feeder pillar box and the dimensions & the number of circuit ways to be provided are exactly as shown in the enclosed sketch.

Details	Dimensions
i) Breadth of Pillar box.	791 mm
ii) Depth of Pillar Box	322 mm
iii) Height of Pillar box	862 mm
iv) Center to center Distance between busbar	185 mm
v) Length of Aluminium flat	765 mm

vi) Number of circuit ways	12way
Tolerance as per IS/ IEC standards	

2.8. Vermin Entry Prevention

At the bottom of the Pillar box Vermin Entry Prevention should be made with suitable cable entry.

3.0 TYPE TEST:

The Bidders shall submit the below type test reports for the HRC FUSE switch 12way LT Feeder pillar box as per IS/IEC 61439-1 and IS/IEC 61439-2.

1. Verification of the short circuit withstand Strength - IS/IEC 61439-1 and IS/IEC 61439-2
2. Verification of Temperature rise - IS/IEC 61439-1 and IS/IEC 61439-2
3. Verification of IP-44 Test - IEC 60529

All the type test certificates not less than five years old on the date of bid submission. The tests should be done in CPRI or Government labs

4.0 INSPECTION:

The supplier shall afford necessary facilities to the BESCOM representative to inspect the material before dispatch of material. All the routine tests as specified shall be conducted in the presence of BESCOM representative. The supplier must intimate the programme of test 10 days in advance to enable this office to depute the representative for witnessing the test.

5.0 INSPECTION AND TESTING BEFORE DISPATCH:

The material will be inspected by Engineers of the BESCOM or its authorized representative before dispatch. All routine tests shall be conducted in the presence of designated person. The approval for the tests or test certificate shall be obtained and also the dispatch instructions shall be obtained before dispatch of the goods. Any materials found to be not in conformity with the specification as detailed in the schedule will be rejected. The supplier has to replace them by good ones immediately and the second inspection at the Factory premises shall be at supplier cost as per BESCOM norms. BESCOM may accept replacements conforming to the specification.

6.0 INSPECTION AFTER RECEIPT OF MATERIALS:

The material will be inspected on site. If material is found to be not in conformity with the specification as detailed in the schedule, it will be rejected. In such cases, the supplier has to take back the rejected material at his own cost and again offer for inspection duly paying the re-inspection charges as per the norms.

7.0 TEST CERTIFICATE:

All routine tests as specified in the relevant clauses shall be conducted and test reports in the form of test certificates duly signed by a responsible officer of your organization shall be submitted to the inspecting officer at the time of inspection.

8.0 DELIVERY OF MATERIALS AND DISPATCH INSTRUCTIONS:

No materials/equipment shall be dispatched until test certificate wherever applicable, are approved and dispatch instructions have been given.

9.0 COMPLETION OF SUPPLY:

The materials shall be supplied complete with required specifications for their efficient operation

TECHNICAL PARTICULARS FOR HRC FUSE SWITCH BASED 12WAY LT FEEDER PILLAR BOX		
Sl. No	TECHNICAL PARTICULARS	
1	Rated Voltage	440V Between Phases
2	System	A.C. 3 phase 4 wire 50cycles/second
3	No of circuit way	12Way
4	Rated frequency	50Hz
5	**SERVICE CONDITIONS**	
	Maximum ambient temperature	50°C
	Minimum ambient temperature	3.5°C
	Relative humidity	10 to 100%
	Maximum rainfall	1450mm
	Maximum wind pressure	150kg/Sq.m
	Maximum altitude above mean sea level (Meters)	1000Meters
	Isokeraunic level	50Days/year
	Seismic level (Horizontal acceleration)	0.3g
	Climate Moderately hot and humid tropical climate, conducive to rust and fungus growth	
6	**ENCLOSURE DETAILS**	
	a) Type of Enclosure	Thermoset Plastic
	b) Dimensions in mm	862(Height)X322(Depth)X791(Width)
	c) IP Protection	IP 44
	d) Colour of Box	RAL 7035 light grey
	e) Name of the manufacturer	M/s JEAN MUELLER INDIA PVT LTD
	f)Impulse Withstand Voltage	8 KV
	g) Rated short time withstand Current	25KA RMS for 1 sec (Phase Busbar)
	h)Fault arc withstand (Class A)	10kA for 300ms
	i) Dry Heat test	As per requirement Part 10.2.3.101 of DIN EN 61439-5
	j) Mechanical Impact	As per requirement Part 10.2.101 of DIN EN 61439-5

	k) Flammability Test	As per requirement Part 10.2.3.102 of DIN EN 61439-5
	l) Thickness	3mm average
7	**INCOMING CIRCUITS**	
	a) No of Incoming Circuits	2
	b) Incomer details of switchgear	NH strip type Fuse Switch Disconnector, 3Pole, Rated current - 630A, Size-3, Vertical Mounting
	c) Name of the manufacturer	M/s JEAN MUELLER INDIA PVT LTD
	d) Switchable Type	Three Pole switchable (Gang Operated)
	e) No of poles	3
	f) Utilization Category	AC-23B (630A/400V)
	h) Cable termination type	M12 Bolt type with crimping bimetallic sockets
	HRC Fuse link details	
	a) Rated current	315A
	b) Rated Voltage	500A
	c) Type	gG category
	d) Rated Breaking capacity & Size	120KA & Size 2
	e) Total no of fuselink(Quantity)	6Nos
	Cable Size Details	
	a) Size of cables used for incoming in Sq.mm	Maximum- 240Sq.mm XLPE Aluminium cable
8	**OUTGOING CIRCUITS**	
	a) Total no of outgoing Circuits/way	12
	b) No of outgoing fuse switch Disconnector	7
	Outgoing Circuits - 2Way	
	a) Outgoing details of switchgear	NH strip type Fuse Switch Disconnector, 3Pole, Rated current - 160A, Size-00, Vertical Mounting
	b) No of fuse switch Disconnector	2Nos
	c) Name of the manufacturer	M/s JEAN MUELLER INDIA PVT LTD
	d) Switchable Type	Three Pole switchable (Gang Operated)
	e) No of poles	3
	f) Utilization Category	AC-23B (160A/400V)
	g) Cable termination type	Bolt type with crimping bimetallic sockets

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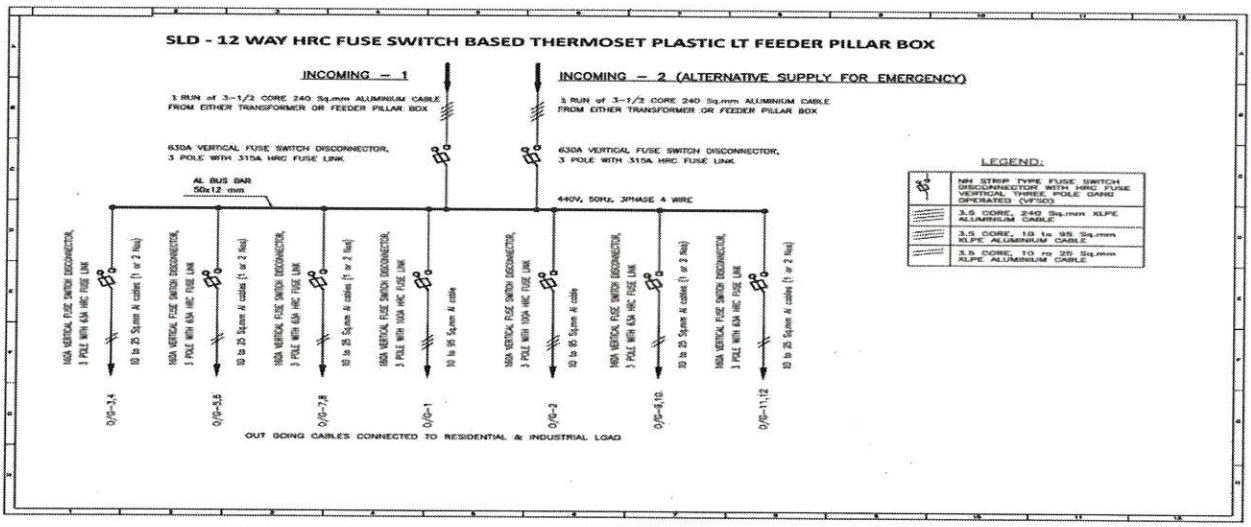
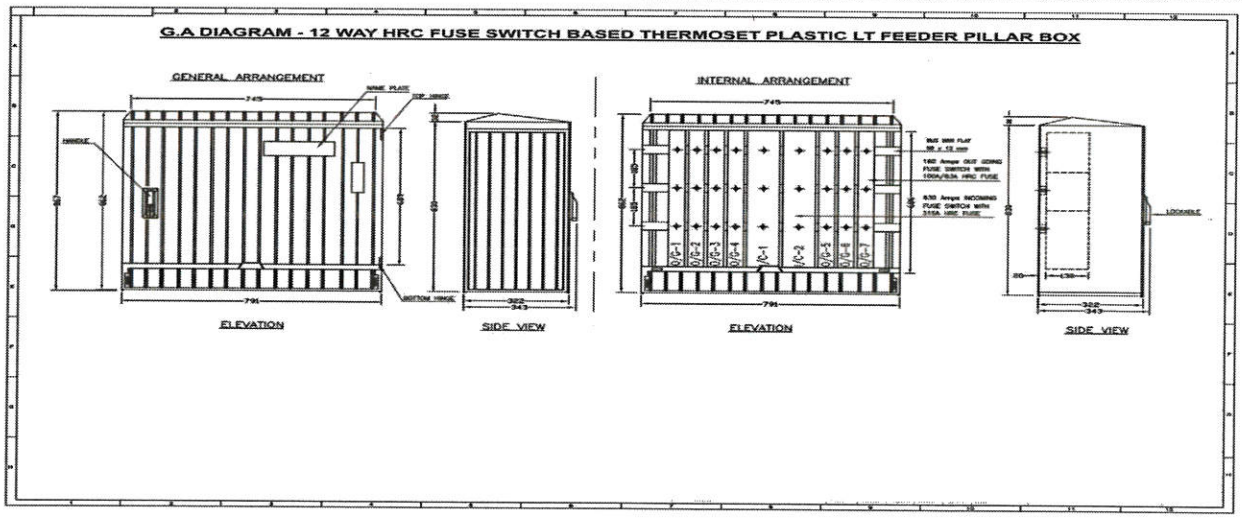
	Outgoing HRC Fuselink details	
	a) Rated current	100A
	b) Rated Voltage	500V
	c) Type	gG category
	d) Rated Breaking capacity & Size	120KA & Size 000
	e) Total no of fuselink(Quantity)	6Nos
	Cable Size Details	
	a) Size of cables used for outgoing in Sq.mm	1No of 10 - 95Sq.mm XLPE Aluminium cable
	Outgoing Circuits - 10Way	
	a) Outgoing details of switchgear	NH strip type Fuse Switch Disconnector, 3Pole, Rated current - 160A, Size-00, Vertical Mounting
	b) No of fuse switch Disconnector	5Nos
	c) Name of the manufacturer	M/s JEAN MUELLER INDIA PVT LTD
	d) Switchable Type	Three Pole switchable (Gang Operated)
	e) No of poles	3
	f) Utilization Category	AC-23B (160A/400V)
	g) Cable termination type	Bolt type with crimping bimetallic sockets
	Outgoing HRC Fuselink details	
	a) Rated current	63A
	b) Rated Voltage	500V
	c) Type	gG category
	d) Rated Breaking capacity & Size	120KA & Size 000
	e) Total no of fuselink(Quantity)	15Nos
	Cable Size Details	
	a) Size of cables used for outgoing in Sq.mm	2No of 10 - 25Sq.mm XLPE Aluminium cable
9	**BUSBAR DETAILS**	
	a) Material of Bus Bar (Phases(R, Y, B) & Neutral)	Electrolytic grade aluminium
	b) Bus bar size	50mm X 12mm
	c) Bus bar Mounting Arrangement	internally moulded in the enclosure
	d) Center to center distance between Bus bar	185mm

10	Gland Plate(Minimum)	4mm thick
11	**Cable Entry & Exit Management**	
	a. For Incoming	Rubber Gland at Bottom 2 Nos
	b. For Outgoing	Rubber Gland at Bottom 12 Nos
12	**Bi-Metallic Lug for Connecting to Fuse Switch Disconnector**	
	a. For Incoming	240 Sq.mm 6 Nos
	b. For Outgoing	95 Sq.mm 6 Nos, 25 Sq.mm 30 Nos
13	**Aluminium Lug for Connecting to Neutral Bus Bar**	
	a. For Incoming	240 Sq.mm 2 Nos
	b. For Outgoing	95 Sq.mm 2 Nos, 25 Sq.mm 10 Nos
14	Vermin Entry Prevention	Yes, Suitable Cable Entry


SLD - 12 WAY HRC FUSE SWITCH BASED THERMOSET PLASTIC LT FEEDER PILLAR BOX
INCOMING – 1
INCOMING – 2 (ALTERNATIVE SUPPLY FOR EMERGENCY)
630A VERTICAL FUSE SWITCH DISCONNECTOR, 3 POLE WITH 315A HRC FUSE LINK
AL BUS BAR 50x12 mm
440V, 50Hz, 3PHASE 4 WIRE
LEGEND:
OUT GOING CABLES CONNECTED TO RESIDENTIAL & INDUSTRIAL LOAD



Annexure-5

TECHNICAL SPECIFICATION FOR 1.1 KV CROSS-LINKED POLYETHYLENE INSULATED (HEAVY DUTY) ARMOURED PVC SHEATHED UG CABLE.

1.00 SCOPE:

The scope of this specification covers the design, manufacture, stage inspection at work, inspection and testing of finish cables at manufacturers works, testing at independent test house, packing, transport and delivery to consignee address of 1.1 KV stranded aluminum, XLPE insulated heavy duty armoured and sheathed power cable for working voltages up to and including 1100 volts underground cables as per specified construction.

2.00 TECHNICAL REQUIREMENT:

1.1 KV grade, 90° C rating heavy duty power cable with stranded circular shaped aluminum conductor cross linked polyethylene insulated inner sheathed of extruded PVC, galvanized steel strip armoured and PVC ST-2 overall sheathed. The cable should be suitable for use in solidly earthed system.

3.00 STANDARDS:

3.01 The 1.1 KV UG cable shall, in general meet the requirements of the latest edition of the Bureau of Indian Standards (Generally refereed as IS), IS: 7098 (Part-I) 1988.

3.02 The cables and components in general shall meet the requirements of the following standards with latest amendments or equivalent international standards.

IS:7098 (Part-I)	***1988***	:	*Specification for cross linked polyethylene insulated PVC sheathed cables.*
IS:8130	*1984*	:	*Specifications for conductors for insulated Electric Cables.*
IS:3975	*1988*	:	*Specification for mild steel wires, strips and tapes for armouring of cables.*
IS:10810 (Part 1 to 55)	*1984*	:	*Specification for test on cables.*
IS:5831	*1984*	:	*Specification for PVC insulation and sheath of electric cables.*
IS:10418	*1982*	:	*Specification for drums for electric cables.*
IS:10462	*1983*	:	*Fictitious calculation method for determination of dimensions of protective coverings of cables: part 1 elastomeric and thermoplastic insulated cable.*

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3.03 The 1.1 KV underground cables shall be manufactured to the highest standard quality, best workmanship with scientific material management and quality control. The bidder shall furnish the quality plan, giving in detail the quality control procedures/management system.

3.04 The successful bidder shall give sufficient advance notice to the purchaser of not less than fifteen days to arrange for stage inspection and inspection of quality assurance programme during manufacture, at the works.

3.05 Cable complying with other internationally accepted standards such as IEC, VDE, IPCEA etc., will also be considered in case they ensure performance and constructional features equivalent or superior to standards listed above. In such a case, the Bidder shall clearly indicate the standard/standards adopted and furnish a copy of English version of the latest revision of standard(S) along with a tender and shall clearly bring the salient features for comparison.

3.06 In case of any conflict between the referred specification code or standards and this technical specification, the latter shall prevail to the extent of such difference.

3.07 1.1 KV Grade Power Cables to be supplied under this package shall be ISI approved and marked as such. Non compliance of above shall not be accepted.

3.08 However, if cable to be supplied under this specification are manufactured out side India and conform to other internationally accepted equivalent or superior standards the above clause shall not be applicable.

4.00 DESIGN CRITERIA:

4.01 The cables that are covered in these specifications are intended for use in the Karnataka Power distribution system, under the climatic conditions and installation conditions described in the technical specification.

4.02 Any technical feature, not specifically mentioned here, but is necessary for the good performance of the product, shall be incorporated in the design. Such features shall be clearly brought out under Technical deviations schedule only in the offer made by the bidder, giving technical reasons and justifying the need to incorporate these features.

4.03 For continuous operation of the cables, at specified rating the maximum conductor temperature shall be limited to the permissible value as per the relevant standard, generally not exceeding 90° C under normal operation and 250° C under short-circuit conditions.

4.04 The cables in service will be subject to daily load cycles of two peaks during day, morning peak and evening peak, with reduced loading during the nights.

4.05 The materials used for sheaths shall be resistant to oils, acids, alkalies and chemicals.

4.06 The cables shall have the mechanical strength required during handling and laying.

4.07 The cables shall be designed to withstand the thermo-mechanical forces and electrical stresses during normal operation and transient conditions.

4.08 The cables shall be designed to have a minimum useful life span of forty years.

4.09 Core identification: the core identification for cables shall be provided, by suitable means, like, by application of coloured stripes or any numerals or by printing on the cores as per Clause-10 of IS : 7098.

4.10 For identification coloured stripes, red, yellow & blue colours shall be used to identify the phase conductors & black to identify reduced neutral conductor.

5.00 MANUFACTURE PROCESS, CROSS LINKING OF INSULATION:

5.01 Cross linking of the insulation material (Pre compounded polyethylene) shall be conforming to IS:7098 (Part-I).

5.02 The conductor shall be of extruded semi conducting compound. The insulation screen shall consist of the non-magnetic metallic part. The XLPE insulation and the shields for conductor and insulation shall be extruded in one operation.

5.03 Process of curing is of Dry Curing.

6.00 MATERIALS:

6.01 **CONDUCTOR:**

The conductor shall be of stranded Construction. The material for conductor shall consist of plain aluminium of H2 or H4 grade as per Clause –3 of IS: 8130/1984. The No. of wires in the conductor shall be not less than the appropriate minimum number given in Table-2 of IS: 8130/1984.

6.02 **INSULATION:**

The insulation shall be cross linked polyethylene conforming to the requirements given in Table-1 of IS: 7098 Part-I.

For multi core cables, the interstices at the Centre shall be filled with a non-hygroscopic material. The interstices around the laid up cores shall be covered with PVC compound type S.T.2. This will form the inner sheath for multicores.

6.03 **ARMOURING:**

The armour shall be galvanized steel strip, complying with the requirements of IS: 3975.

6.04 **OUTER SHEATH:**

The outer sheath shall consist of Poly Vinyl Chloride (PVC) compound, conforming to the requirements of Type ST-2 of IS: 5831 suitable additives shall be added to give anti termite protection.

7.00 CONSTRUCTION:

7.01 The general constructional features of the cables shall be as follows:

a) Stranded circular shaped Aluminium conductor. Cross linked polyethylene insulation, cross linked shall be conforming to IS: 7098 (Part-I) 1988 with its latest amendment. Extruded PVC inner sheath. Armour (Galvanized steel strip). Outer PVC sheath with anti-termite treatment.

b) Cables with reduced neutral conductor shall have sizes as given in table-2 of IS: 7098 Part-I.

8.00 CONDUCTOR:

8.01 The conductor shall be stranded circular shaped Aluminium wires of H2 or H4 grade plain aluminium wires.

8.02 The conductor shall be clean, uniform in size and shape smooth and free from harmful defects.

8.03 Not more than two joints shall be allowed in any one of the single

8.04 Forming every complete length of conductor and no joint shall be within 300mm of any other joint in the same layer. The joint shall be made by brazing silver soldering or electric or gas welding.

8.05 No joints shall be made in the conductor after it has been stranded.

8.06 **INSULATION:**

The insulation shall be provided over the conductor with cross linked polyethylene, applied by extrusion and shall be of high quality, cross linked, shall be confirming of IS:7098 (Part-I).

8.07 **THICKNESS OF INSULATION:**

The average thickness of XLPE insulation shall not be less than the nominal value subject to the applicable tolerance as specified in table 3 of IS: 7098.

8.08 The insulation shall be applied to closely fit on the conductor screen and it shall be possible to remove it without damaging the conductor.

9.00 LAYING UP OF CORES:

9.01 For multicore cables, the core shall be laid together with a suitable right hand lay, where necessary the interstices at the centre shall be filled with a non-hygroscopic material.

9.02 Inner sheath for Multi core cables:

9.03 The cores shall be laid up with a suitable right hand lay and the interstices should be filled with PVC compound type ST-2 conforming to IS: 5831 or equivalent standard.

9.04 The minimum thickness of the inner sheath shall conform to Table 5 of IS: 7098 (Part-I), 1988 or equivalent standard.

9.05 The inner sheath shall be so applied that it fits closely on the laid up cores and it shall be possible to remove it without damage to the insulation.

10.00 ARMOURING:

Application:

10.01 Armouring shall be applied over the insulation in case of single core cables and over the inner sheath in case of twin, three and multicore cables.

10.02 The armour stripes shall be applied as closely as practicable.

10.03 The direction of lay of the armour shall be left hand. For double strip armoured cables, this requirement shall apply to the inner layer of strips. The outer layer shall, except in special cases, be applied in the reverse direction to the inner layer and there shall be a separator of suitable non-hygroscopic material.

10.04 **DIMENTIONS:** The dimensions of galvanized steel stripes shall conform to table 6 of IS: 7098 (Part-I).

10.05 A binder tape may be applied on the armour.

10.06 **JOINTS:** The joints in armour strip shall be made by brazing or welding and the surface irregularities shall be removed. A joint in any strip shall be at least 300 mm from the nearest joint in any other armour strip in the completed cable.

11.00 OUTER SHEATH:

11.01 The PVC outer sheath with anti termite treatment shall be extruded over the armouring for multi core cables and single core cables.

11.02 The colour of the outer sheath shall be black.

11.03 The thickness of outer sheath shall be not less than the minimum value specified in column 5 of Table 8 of IS: 7098 (Part-I) 1988.

12.00 IDENTIFICATION:

12.01 The outer sheath shall have the following information embossed or indented on it, the manufacturer's name or trademark, the voltage grade, the year of manufacture and the letters "BESCOM" 'ELECTRIC'. The identification shall repeat every 300/350 mm along the length of the cable.

13.00 CABLE DRUMS:

13.01 Cables shall be supplied in Non returnable wooden or steel drums of heavy construction and drum shall be properly seasoned, sound and free from defects, wood preservative shall be applied to the entire drum.

13.02 Standard length of each size of power cable to be supplied by the bidder shall be 500/1000 metres. The cable length per drum shall be 500/100 metres. The cable length power drum shall be subjected to a tolerance of ±5% of the standard drums lengths. Acceptance of smaller lengths of cables are subjected to approval of purchaser. Smaller lengths of less than 100 metres will not accepted.

13.03 A layer of waterproof paper shall be applied to the surface of the drums and over the outer most cable layer.

13.04 A clear space of atleast 40 mm shall be left between the cables and logging.

13.05 The cable drum shall carry KST marking with the following information stenciled on both sides of the drum. A tag containing the same information shall also be attached to the leading end of the cable.

a. Reference to the Indian Standards.
b. Manufacturer's Name, Brand Name or Trade Name.
c. Purchase's name, contract No. and date.
d. Type of cable and voltage grade.
e. Number of cores.
f. Nominal cross section area of the conductor.
g. Cable code.
h. Length of the cable on the drum.
i. Number of lengths on drum.

j. Direction of rotation of drum (by means of an arrow).
k. Net and gross weight.
l. Country of manufacture.
m. Year of manufacture.

13.06 Packing shall be sturdy and adequate to protect the cables, from any injury due to mishandling or other conditions encountered during transportation, handling and storage. Both cables ends shall be scaled with good quality heat shrinkable caps so as to eliminate ingress of water during transportation and erection.

14.00 QUALITY ASSURANCE PLAN:

14.01 The successful bidder shall submit following information to the owner:

14.02 Test certificates of the raw materials and bought out accessories.

14.03 Statement giving list of important raw materials, their grades along with names of sub-suppliers for raw materials, list of standards according to which the raw materials are tested. List of tests normally carried out on raw materials in presence of bidder's representative.

14.04 List of manufacturing facilities available.

14.05 Level of automation achieved and lists of areas where manual processing exists.

14.06 List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.

14.07 List of testing equipments available with the bidder for final testing of equipment along with valid calibration reports.

14.08 The manufacture shall submit manufacturing quality plan (MPQ) for approval & the same shall be followed during manufacture and testing.

14.09 The successful bidder shall submit the routine test certificates of bought out raw material/accessories and central excise passes for raw material at the time of inspection.

15.00 Guarantee

15.01 The supplier of cables shall guarantee overall satisfactory performance of the cables.

15.02 At least three copies of type test reports shall be furnished. One Copy shall be returned duly certified by the owner, only after which the commercial production of the concerned material shall start.

15.03 Copies of acceptance test reports shall be furnished in at least Three (3) copies. One copy shall be returned duly certified by the Owner, only after which the materials shall be dispatched.

15.04 Record of routine test reports shall be maintained by the supplier at his works for periodic inspection by the owner's representative.

15.05 Test certificates of test during manufacture shall be maintained by the supplier. These shall be produced for verification as and when desired by the owner.

16.00 Inspection

16.01 The owner's representative shall at all times be entitled to have access to the works and all places of manufacture, where cable, and its component parts shall be manufactured and the representatives shall have full facilities for unrestricted inspection of the supplier's and sub-supplier's works, raw materials, manufacture of the material and for conducting necessary test as detailed herein.

16.02 The material for final inspection shall be offered by the supplier only under packed condition. The owner shall select samples at random from the packed lot for carrying out acceptance tests. The lot offered for inspection shall be homogenous and shall contain cables manufactured in 3-4 consecutive weeks.

16.03 The supplier shall keep the owner informed in advance of the time of starting and the progress of manufacture of material in their various stages so that arrangements could be made for inspection.

16.04 No material shall be dispatched from its point of manufacture before it has been satisfactory inspected and tested unless the inspection is waived off by the owner in writing. In the later case also the material shall be dispatched only after satisfactory testing specified here in has been completed.

16.05 The acceptance of any quantity of material shall in no way relieve the supplier of his responsibility for meeting all the requirements of the specifications and shall not prevent subsequent rejection, if such materials are later found to be defective.

17.00 QUALITY CONTROL:

The Bidder shall furnish a complete and detailed quality plan for the manufacturing process of the cable. All raw materials shall conform to relevant applicable standards and tested for compliance to quality and requirement. During the manufacturing process, at all stages, inspections shall be made to check the physical and dimensional parameters, for verification to compliance to the standards. The Bidder shall arrange for inspection by the purchaser, during manufacture, if so desired by the purchaser to verify the quality control process of the Bidder.

18.00 TYPE TESTS:

18.01 Not withstanding that type test have been conducted earlier, the successful bidder the each member of consortium shall conduct all type tests as per IS: 7098 (Part-I) 1988, with upto date amendments or equivalent international standard and supplies made only after approval of test reports from the purchaser.

18.02 All type tests, routine, acceptance test shall be conducted in the presence of the purchaser, representative.

18.03 The successful bidder shall give FIFTEEN days advance notice for inspections and witnessing of tests by the purchaser or his representative.

18.04 The owner reserves the right to get the cable type tested at any of the BESCOM recognized testing house/laboratory at his own expense for any further tests to verify the compliance with the specifications and to reject the cables in case they are found not satisfying the qualifying requirements as per relevant standards.

18.05 The following type tests will be conducted on the cable as per IS: 7098 (Part-I) .

a) Test on conductor.
b) Test on armour strip.
c) Test for thickness of XLPE insulation and inner & outer sheaths.
d) Physical test on XLPE insulation.
e) Physical test on out sheath.
f) Insulation resistance (volume resistivity) test.
g) High voltage test.
h) Flammability test.

18.06 **ACCEPTANCE TEST**:

The sampling plan for acceptance test shall be as per IS: 7098 (Part-I) 1988.

18.07 The following shall constitute the acceptance test.

a) Tensile test for aluminium.
b) Wrapping test for aluminium.
c) Conductor resistance test.
d) Test for thickness of insulation.
e) Test for thickness of inner and outer sheath.
f) Hot-set test for insulation.
g) Tensile strength and elongation at break test for insulation and sheaths.
h) High voltage test.
i) Insulation resistance (Volume resistivity) test.

19.00 ROUTINE TEST:

The following shall constitute routine tests:

a) Conductor resistance test.
b) High voltage test.

20.00 SEALING OF CABLE ENDS ON DRUMS:

20.01 The cable ends shall be sealed properly so that ingress of moisture is completely prevented.

20.02 The individual core endings shall be sealed effectively with water resistant compound applied over the core and provided with a heat shrinkable cap of sufficient length with adequate cushion space so that the conductor does not puncture the cap in case of movement of the core during unwinding or laying. Before sealing, the semi-conducting layer on the cores may be removed for about 2mm at each end, to facilitate checking the insulation resistance from one end, without removing the sealing cap at the other end.

20.03 The multi cores should have an overall heat shrinkable cap with adequate end clearance and sufficient cushioning to prevent puncturing of the overall sealing cap due to stretching of the cores. The sealing cap shall have sufficient mechanical strength and shall prevent ingress of moisture into the cable.The ends of single core cables shall also be sealed on the same lines to prevent entry of moisture.

20.04 **CABLE LENGTHS:**

The cables shall be supplied in continuous lengths of 250-500 Mtrs in case of multi core cables with a tolerance of ±5% of drum length.

21.00 **GUARANTEED TECHNICAL PARTICULARS:** Guaranteed technical particulars of the cables to be supplied is enclosed.

22.00 **SCHEDULE OF DELIVERY:** The details regarding the delivery schedule are given in the Purchase Order/Dispatch instructions.

23.00 **DRAWING & LITERATURE:**

The following shall be furnished along with the tender.

a) Cross sectional drawings of the cables, giving dimensional details for each size of cable.

b) An illustrated literature on the cable, giving technical information on current ratings, cable constants, short circuit ratings, derating factors for different types of installation, packing date, weights and other relevant information.

24.00 **Special Instructions:**

a) If an existing cable is damaged and to be provided with one/two numbers of straight through joint/s without any additional cable/with small cable piece up to a length of 10 m, the same shall be completed within 2 days from the date, cable is identified for joining.

b) The contractor shall complete any specific work of cable shifting (less than 50m length) within 15 days from the date of cable is identified and notice to start the work is intimated orally/in writing by Engineer-in-Charge.

c) The contractor shall complete any specific work of cable shifting (more than 50 m length) within 30 days from the date of cable is identified and notice to start the work is intimated orally/in writing by Engineer-in-Charge

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